



# AMERICAN GAS

*Association*

# MONTHLY

APRIL 1947

VOL. 29 · NO. 4



## Before you invest in the last word in laundries...

Here's every invention to make washday easy... including a speedy Gas clothes dryer and — especially! — a new do-everything washing machine. But *before you invest in one of these wonder washers*, ask yourself this: "Do I have the kind of hot water supply it *must* have to work properly?" Remember... many automatic washers need about 40 gallons of 140° water in 80 minutes to do two loads of snow-white laundry. *The new automatic Gas water-heaters are designed specifically to meet such needs.* They replace the hot water supply speedily. Cost amazingly little to run. Eliminate fuss and inconvenience. In fact, no matter how you wash your clothes, an automatic Gas water-heater is a necessity in every modern household. Order one in the right size for your family — today!

**GAS**  
for the last word in  
automatic water-heating



**WONDERFUL FOR DOING DISHES...** essential if you plan on a new dishwasher! And an automatic Gas water-heater is a real work-saver for those 140 other household uses for hot water, too. See the new models now ready at your Gas Company or dealer's. AMERICAN GAS ASSOCIATION

Shown at the left is the first of three American Gas Association advertisements on automatic gas water heating to appear in the 1947 national consumer campaign. This initial insertion will appear in *Ladies' Home Journal* and *Better Homes and Gardens* for March; *Good Housekeeping* for April, the *Saturday Evening Post* for April 26 and *Collier's* for May 3.

The main art element in each advertisement will depict alternately the modern and efficient bathroom, laundry and kitchen. The headline will dramatize the importance of hot water in actual operation as pictured in the main illustration. Copy will stress essentiality of the automatic gas water heater in making the bathroom, laundry or kitchen truly modern and efficient. Emphasis will be on speed of recovery, economy of use and other features.



*Not spring fever but a spring of feverish activity and down-to-earth planning are the order of the month in the gas industry. Conferences, projects and reports all are keyed to realistic appraisal and solution of major and minor problems. . . . Dr. George R. Harrison calls virile far-sightedness the gas industry's answer to the looming question of atomic energy use. Constant effort is needed, he says, to keep abreast of the fields of science and engineering. . . . H. J. Hense removes much of the haze overhanging research and its value to industry. . . . Frank H. Adams examines the formulation of an industry-wide merchandising plan and finds a fundamental conflict in policy which must be settled before further progress can be made. . . . Meanwhile a modern industrial miracle is announced in the Pittsburgh area which may develop into a major new chemical industry. . . . And speaking of miracles, take the case of the American-made gas range which was buried and hidden from the Japs in the Philippines for four years, recovered and carried across 75 miles of mountain jungle only to work perfectly. . . . Finally, take our advice and let that great miracle—Spring—give you broader horizons and new strength of purpose.*

JAMES M. BEALL  
EDITOR  
JAC A. CUSHMAN  
MANAGING EDITOR

EDITORIAL OFFICES:  
AMERICAN GAS ASSOCIATION  
420 LEXINGTON AVE., NEW YORK 17, N. Y.



## CONTENTS FOR APRIL 1947

### FEATURES

INDUSTRY AND THE ATOM—by Dr. George R. Harrison . . . . .	159
THE PARADOXICAL POSITION OF GAS—by Frank H. Adams . . . . .	161
USE THE FEMININE SLANT, MR. SALESMAN—by Helen Kirtland . . . . .	164
HUGE PROJECT WILL CONVERT COAL TO GAS . . . . .	167
CLEARER FOCUS ON RESEARCH—by H. J. Hense . . . . .	168
NEW REQUIREMENTS FOR AUTOMATIC GAS RANGES . . . . .	170
STORAGE IN BURIED PIPE—by C. R. Cloxton, M. G. Merkle and D. V. Meiller . . . . .	171
PROVED NATURAL GAS RESERVES RISE . . . . .	174
HOLLYWOOD COOKS WITH GAS . . . . .	180

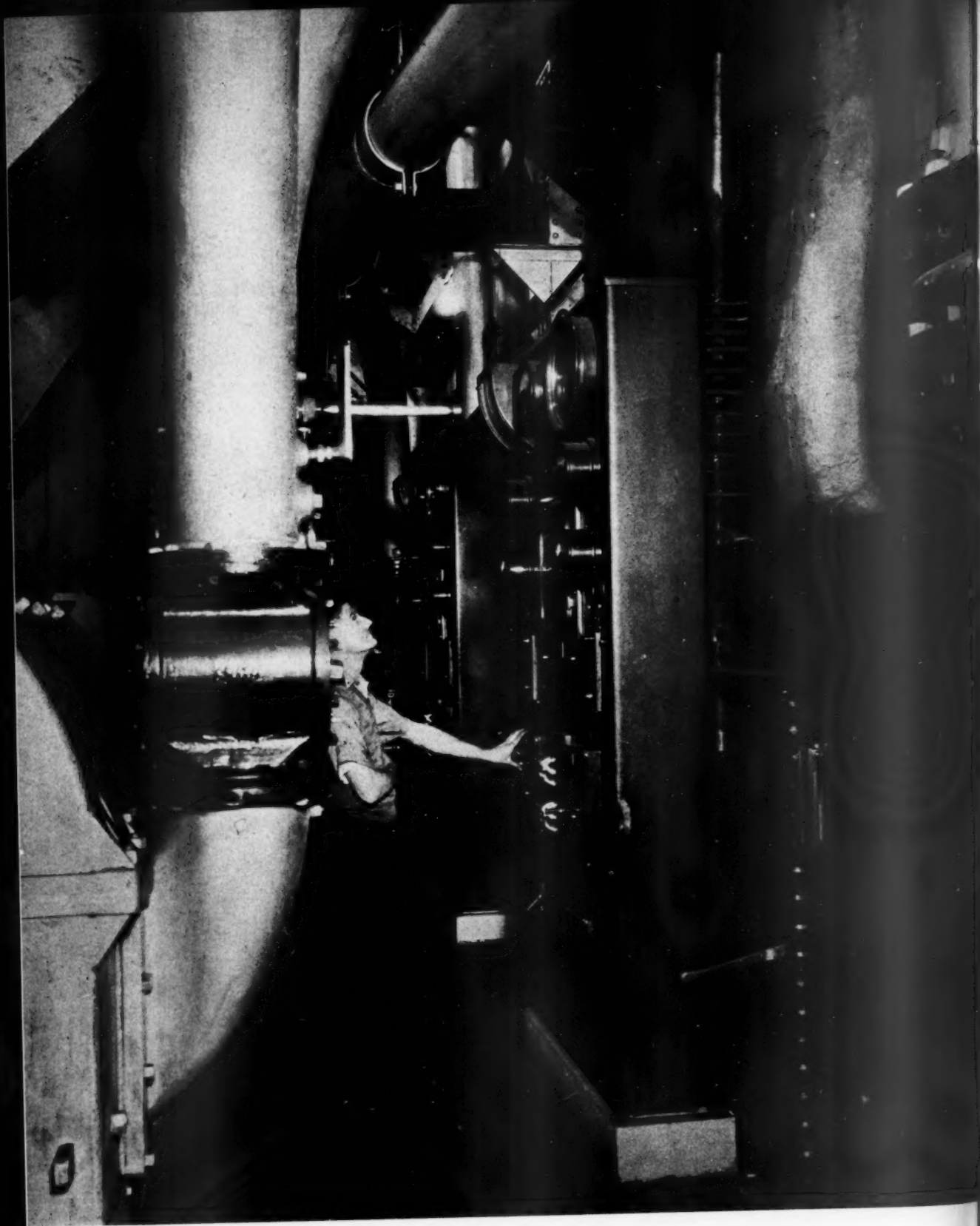
### SECTIONS

JOHN DOE GETS HIS "DOUGH"—by John A. Williams . . . . .	185
MIDWEST SALES MEETING OUTSTANDING . . . . .	189
FAST-MOVING SALES CONFERENCE . . . . .	191
PROTECTING PIPE IN OPEN SYSTEMS—by M. D. Appleman . . . . .	194

### DEPARTMENTS

CONVENTION CALENDAR . . . . .	184
LABORATORIES . . . . .	197
ASSOCIATED ORGANIZATION ACTIVITIES . . . . .	198
PERSONAL AND OTHERWISE . . . . .	200
OBITUARY . . . . .	202
NEW A. G. A. MEMBERS . . . . .	202
PERSONNEL SERVICE . . . . .	204

• Subscription \$3.00 a year - Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which is a bi-monthly issue. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York 17, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, Feb. 10th, 1922, under the Act of March 3, 1879. Cable addresses: American Gas Association, "Amerigas, New York"; American Gas Association Testing Laboratories, "Amerigaslab, Cleveland."



V  
ene  
ene  
we  
ins  
litt  
ho

the  
wo  
too

giv  
pli  
the  
and

ter  
of  
ica  
eve  
no

of  
it  
mi  
ab  
wh  
of  
po  
po

P  
in

●  
fer





## Industry and the Atom

**W**HAT is going to be the ultimate effect of nuclear energy, commonly called atomic energy, on the gas industry? Can we expect that 20 years from now, instead of paying a monthly gas bill, everyone will have a little pea-size hunk of plutonium in the cellar to heat the house?

The answer is "No," for three reasons. In the first place, the method would be too wasteful. In the second place, it would be too expensive, and in the third place, it would be too dangerous.

Now, these reasons are probably the ones that would be given by a very naive person when first considering the implications of atomic energy. I am convinced, however, that the same answer will be arrived at by anyone giving careful and thorough study to what atomic energy involves.

Let us take a pound each of four energy-containing materials—first uranium, then coal, butter, and finally a pound of dynamite. The question is, which contains the most chemical energy? You have all read the papers so you know that everybody is supposed to say "uranium." Of course that is not right or I wouldn't have brought it up.

If I arrange these materials in the order of their content of chemical energy, I must put the uranium lowest, since it contains only 2200 B.t.u. per pound. Next come the dynamite with 2300 B.t.u. per pound and the coal, which has about 14,000 B.t.u. per pound. Finally comes the butter, which has about 16,000 B.t.u. per pound. If I had a pound of natural gas, it would be highest with 20,000 B.t.u. per pound. I am assuming there are 20 cubic feet of gas in a pound and around 1,000 B.t.u. per cubic foot.

Now, you see it would be perfectly all right to advertise

BY DR. GEORGE R. HARRISON

*Dean of Science, Massachusetts Institute of Technology, Cambridge, Mass.*

that your gas contains eight times as much chemical energy as uranium, which is the material of which the atomic bomb is made. There is a catch, of course. I said

"chemical energy."

In discussing nuclear energy we must get down inside the molecule, which is where the chemical energy is stored. If we talk about the total amount of energy in these materials, how would we arrange them? Now one would say, of course, that the uranium goes up to the top. Again that would be wrong. The total amount of energy contained in these samples of material is the same for all. This is the Einstein energy—the energy that is released when all of a piece of matter is converted into energy. It doesn't matter whether you select uranium or butter or water or wood or any other material—all contain the same number of B.t.u. per pound, and that number is about 40,000 billion.

Now, you may wonder why I talk about this when no one has yet succeeded in releasing that energy. I do so because we read about it nearly every day in the newspapers. Reporters are constantly worrying about whether the ocean is going to catch fire when scientists are monkeying with sub-surface atomic explosions, or whether the atmosphere is going to blow up and annihilate the planet. Such discussions have to do mostly with this ultimate Einstein energy, and not with the energy of the atomic bomb.

We must be very, very careful to distinguish between what scientists know how to do today and what they may someday learn how to do. At the present time, no one knows how to get out all of the energy that is in these materials. At present we do know how to get one tenth of one percent of this energy out of two materials—uranium and thorium.

What would I have to do with this chunk of uranium to

Presented at A. G. A. Sales Conference on Industrial and Commercial Gas in Boston, March 17-19.

● Opposite: Backstage view of a Stamford, Conn., gas plant showing controls of a scientific automatic stoker system which feeds soft coal into pulverizers, then into burners where fires are fanned by forced draft. Photo by Ewing Galloway, N. Y.

make it blow up and release 40 billion B.t.u.? I would have to sort out all extraneous atoms so as to have nothing left but very pure uranium atoms of two kinds, the so-called U-235 and the U-238, which is slightly heavier. That is quite a job, and how to do it is the secret of the atomic bomb.

How many atoms are there in this sample of uranium which weighs a pound? To give the number directly would not mean anything. It is enough to say that if I started picking off atoms from this chunk, one at a time, and put a million atoms in each pile until I had a million piles, and made a million sets of a million piles of a million atoms each, I would have taken away only one millionth of the pound of uranium.

### Undesirable Atoms

This emphasizes why it is such a job to prepare uranium to get the nuclear energy out of it. If you leave undesirable atoms, any impurity, the chain reaction that allows the energy to be released will be dampened.

Remember that when highly purified uranium is put in a large reaction pile, such as exists out at Hanford or down at Oak Ridge, for each pound of plutonium formed one million kilowatt-days of energy is set free. That is 24 million kilowatt hours.

One can see that every industry that involves energy has a right to be worried about possible competition from such a producer of power. But when we look at what has happened in the past, we find that this situation is much like that which frequently arises to worry people about technological unemployment. There is no such thing as technological unemployment for people who are willing to go along with progress. Technological employment is much more prevalent than technological unemployment.

What became of the livery stable proprietors? There were about 100,000 of them in the United States at one time. They have been replaced by about three million people who look after automobiles. The people who were left out were those who *stayed* in the livery stable business. I am not saying at all that people in the gas industry should go into the nuclear power business.

I understand that in spite of the fact that there is great competition from oil nowadays, more coal is mined in the world than ever before in history. I am told that in spite of the competition from coal and oil and gas, more wood is cut for fuel purposes in the world today than ever before in history.

In other words, experience shows that mankind does not throw away one form of energy when a new one becomes available. We need all the energy we can get hold of. New forms of energy *supplement* but do not *supplant* old forms of energy.

The reason for this is basic. Our wealth in the long run all goes back to the availability of energy. Why is the average citizen of the United States more than twice as wealthy ordinarily as the average citizen of Great Britain, six times as wealthy as the average citizen of Italy, 20 times as wealthy as the average citizen of China? It is because he has available that much more energy to run street cars, airplanes, and automobiles, keep houses warm, and do whatever else he wishes, within limits. We can correlate our wealth level with this level of the availability of energy.

Each citizen of the United States right now has energy corresponding to 84 men working eight hours a day for him. In Great Britain, only half that energy is available. Every year, our wealth level goes up. We worry about our national debt, we worry about our



Dr. George R. Harrison

earning power and the number of jobs; but these are constantly going up, as new energy becomes available for use.

How wealthy can we become? It is pretty hard to set a limit on that, but I can at least give you a pretty good estimate as to how far we can go before we have to start worrying, and I won't do it in terms of oil or coal or gas or wood.

All of our energy, of course, has come from the sun originally, and it is worth remembering that every day 200,000 times as much energy falls on the earth from the sun as we use for every conceivable purpose. One could run all of the industries in the United States from the sunlight that falls in one day on a little area of desert ten miles by 20 miles if one knew how to capture the energy effectively. So if you give us a ten percent efficiency factor we can become 20,000 times as wealthy as we are now without using any atomic energy.

We have atomic energy and we know how to use it. What are we going to do with it? We would be extremely foolish if we threw it away on doing things that we can do with gas or wood or oil or coal as fuel, because atomic energy is energy of very high potential. It corresponds to hundreds of millions of volts, and it is the only source we have, except for cosmic rays, of energy of this very high potential.

Therefore, I believe that as soon as we have had time to take our bearings a bit, we are going to restrict the use of atomic energy to needs which involve the requirement of very high potential, and we are going to use our present fuels, including gas, for ordinary uses as we do today.

Any industry which understands the value of research and keeps abreast of progress in the fields of science and engineering has absolutely nothing to worry about in regard to competition from atomic energy. The one point I want to make is the importance of research.

If your industry keeps in mind the very great importance of keeping up to date, then you can look forward to an increase in prosperity as science progresses. The great lesson of atomic energy for the gas industry is to keep looking ahead.

# The Paradoxical Position of Gas

Fundamental conflict between successful marketing elements and tendency toward the status quo must be solved by industrywide general merchandising plan



Frank H. Adams

**E**IGHTEEN months after VJ-Day we find ourselves in the strongest economic and competitive position in the history of the gas industry.

Manufacturers have accepted gas as the most practical fuel for heating and heat treating of glass and metals. The cooking load has reached an optimum; automatic laundries and dish washers are making automatic water heating a necessity. The demand for gas house heating is unprecedented. Good-will has increased tremendously since prewar days, due to the remarkable service rendered by the utilities and gas-burning equipment during the war years. Public confidence in the gas utilities is at an all-time high.

Technological developments have outdistanced those in competitive fuel fields. Manufacturers have developed equipment and processes that greatly enhance the economic advantages of gas as an industrial heating and heat processing fuel. A good example is the development of atmosphere gas generators for processes using atmosphere furnaces.

## Gas in Automotive Industry

Today the automotive industry and steel strip production are dependent upon one or more of the four types of extremely accurate, highly developed gas generators. It was initially demonstrated in the automotive field that industrial gas could be utilized for furnishing the carbon for the steel in the carburizing process. This art has been steadily improved until today the balance between the gas atmospheres and the steel itself is so accurately controlled that it is used to restore the carbon in

BY FRANK H. ADAMS

*President, Surface Combustion Corp.  
Toledo, Ohio*

the decarburized skin of the metal part without changing the carbon content directly beneath this skin.

These atmospheres also are capable of what is known as "suspended carburization." This permits a charge in the process of being carburized to be held over for long periods of time in the furnace without changing its carburizing characteristics. This has a definite economic advantage for plants handling variable loads or stand-bys over the weekend. Also, these gas atmospheres have made possible the dry-cyaniding process by means of which a hard case can be formed, combining the advantages of carburizing and nitriding.

## Previous Methods Obsolete

The atmospheric gas carburizing machines are carrying all of these, in addition to the basic load, because they have completely obsoleted previous methods of carburizing. In the steel industry, the complete responsibility for the bright annealing of sheets and coils is placed on the atmosphere furnished by the gas generator. Charges up to one million pounds of mirror-bright steel in a single furnace give best evidence of the dependence the steel industry places on these machines.

Developments in the nitrogen atmosphere, using industrial gas as the medium for generating this nitrogen, have demonstrated such advantages in tin-coated strip that there is every evidence that food processors will force the universal use of this atmosphere for tin plate for their product.

Another type of gas atmosphere generator is one that can supply an atmosphere which will pickle sheets or strip at a red heat, prior to metal coating. Speeds up to 300-feet-per-minute have been utilized with this process. No fur-

ther explanation is needed to demonstrate the advantages of this system in metal coating, as compared with the wet pickle methods previously used.

The recent development of the dew-point recorder provides an automatic instrument for the close maintenance of these special atmospheres.

Equally important improvements and developments have been made in domestic heating equipment.

The favorable factors of market acceptance, improved economic conditions, public recognition of the shortcomings of non-gaseous fuels for domestic and industrial uses, improvement of old and development of new equipment and processes, appear to have placed the gas industry in the position we have all so long planned, hoped, invested, and worked to obtain—the position of leadership, dominance, and limitless expansion.

If this were unqualified truth, then our job of industry-wide merchandising cooperation would be normal. But unfortunately, it is not true of the gas industry as a whole.

Let us consider the factors which interfere with the immediate formulation of a general merchandising plan to attain our desired position.

**First:**—You have over-sold your capacity. Your service in a period of five years when you had no sales force has

## Cycle?

● When the first atomic bomb exploded in New Mexico, the desert sand turned to fused green glass.

This fact, according to the magazine "Free World," has given certain archaeologists a turn. They have been digging in the ancient Euphrates Valley and have uncovered a layer of agrarian culture 8,000 years old, and a layer of herdsman culture much older, and a still older caveman culture. Recently they reached another layer . . . of fused green glass.

Think it over, brother.

—This Week

Abridged version of talk presented at A. G. A. Sales Conference on Industrial and Commercial Gas, Boston, March 17-19.



obtained an acceptance that seems to many surprising, if not frightening. Instead of a restriction of use and a decreased demand with the return to civilian production, there has been little if any decline, and in some communities the industrial gas load has actually increased.

In the house heating field, you had the finest sales force conceivable during the war period—your customers who sat back in comfort boasting of their good judgment and foresight and watching their neighbors worry with oil rations, coal deliveries, and coal shortages. Now all of those neighbors are wanting and demanding the comfort and convenience of gas heating.

**Second:**—Inability of gas companies to materially increase their facilities for

### People's Choice

People expect to be served by gas. Public opinion will demand gas service. Industry needs gas. Your community needs expanding industry. You need industry to insure your present investments.

—Frank H. Adams

the supply of gas during or immediately following the war has caused many of them to wholly or partially discontinue installation of commercial and residential heating equipment, shut off interruptible load, and in certain areas discourage the use of gas for additional industrial heating and processing.

**Third:**—There is a question as to the quantity and economic stability of this load at rates necessary to justify investment in additional plant capacity. This question is particularly serious with respect to house heating.

**Fourth:**—There is the problem of raising capital for expansion of facilities when the policies and decisions of the Federal Power Commission seem adverse to sound investment.

**Fifth:**—It now appears that 1947 will be a year of limited sales activity, of rehabilitation, of expansion in many properties. During this time certain markets will be neglected and competition there will become thoroughly entrenched. The competitive industries will not only take advantage of our present restricted activity, but will put forth every effort to build future acceptance and make our

task of recapturing a neglected and competitively presold market both costly and laborious.

To some of us our present position may be a migraine—apparently incurable. To others it may resemble a Frankenstein. And to the marketing men our present favorable position may be analogous to the ardent Lothario, who, having wooed and won the maiden fair, deserted her at the church door.

Our situation is paradoxical, without precedent in the history of our industry. It contains most of the market elements essential to success admixed with those conducive to stagnation and deterioration. It would be so much simpler if we could ignore the need of additional capital investments for plant expansion and new pipelines and the expenditure of effort and energy that an expanding industry imposes. Herein lies the real challenge to our initiative, foresight and confidence in the gas industry.

**Can the industry ignore need for expansion and maintain the status quo?**

I believe the utilities should accept the full responsibility of providing gas service to meet the demands of the rightful market which they can supply on an economic basis sound to themselves and their customers.

This means accepting a higher saturation of house heating than has been considered in many cities. The economics of the industrial and house heating load should be considered together—not independently. Industrial and commercial off-peak load should be developed to balance house heating load as far as possible. This may mean lower overall load factors and higher rates. That challenge too should be accepted.

I do not suggest that gas rates be raised to a level where they would price people out of the market, nor to a point where a decline in spendable income would encourage the removal of equipment. People right now are price-increase-conscious. The public, including present users, would not object to a reasonable increase in rates for it is conditioned to the necessity of price increases, knows the cost of competitive fuels and realizes that gas companies have had no relief from increased costs. Most rates are 12 years or more old and are not based on today's conditions, or costs. People real-

ize that they are getting a bargain in gas heat at today's prices.

Gas heat is a convenience which the user wants and will definitely appreciate and pay for, even if it means an adjustment in the user's spending and method of living.

Therefore, we should re-cast our sights—recognize that the prewar marketing pattern for establishing the value of gas heat has changed to public recognition and demand for its comforts and conveniences, even at a comparable prewar premium price.

Such procedure means placing increased emphasis on the work being carried on by the Gas Production Research Committee to give the most economical combination of base-load and peak-load production equipment.

Every plant has its individual problems depending on production equipment and the characteristics of the gas it is producing. The Production Research Committee is making notable progress in showing the way to development of maximum capacity from present equipment. Better operation and balancing up of the existing facilities has already produced results far beyond prewar expectations.

Of course, the invaluable component to an integrated industrial and house heating load is peak-load capacity. Here propane-air is first choice to the maximum usable capacity within the limits of an acceptable mixed gas.

By utilizing our own experience in atmosphere gas generating equipment, we have developed a propane cracking plant, at a considerably lower investment cost per mcf than carbureted water gas, practically automatic in its operation and capable of matching acceptably most manufactured and mixed gases in this area.

## Printing

● Printing is the great constructive force in the modern civilized world. It plays the indispensable part in the dissemination of news, in the expression and progression of political ideals, in the records and exchange of commerce and industry. It democratizes education, science, art, music and broadens the scope of everything it touches. Its service is vital in upbuilding and sustaining business through advertising.—*American Printer.*

The fact that this plant can be floated anywhere on the distribution system adds increased flexibility to handle peak-load capacity, particularly where the ability to handle such loads with central station capacity is complicated by distribution problems.

We need more studies along the lines of the work done by Hall Henry's committee on the economics of house heating, published as part of the Postwar Planning Committee report.

To those more pessimistic than I as to the industry's ability to solve these problems, I suggest a look backward to the postwar period following World War I. By comparison today we have everything to work with—public acceptance, equipment, technical knowledge, bank credit. Only two more things we need—adequate gas supply and confident salesmanship.

Let's consider the job of the utility sales department and ways manufacturers and utilities may cooperate in what is obviously a major promotional program.

The big present job is to keep customers sold on gas, even though you cannot make an increased supply of gas immediately available.

One of my salesmen remarked to me some time ago that it would seem good when he again had something to sell. I agreed with him but asked if he didn't think he had at present the most important and difficult sales job he had ever had—that of maintaining and increasing goodwill.

Your sales departments have the same job. To carry it out, I would recommend the upgrading, where practical, of all equipment, both industrial and domestic. Customer contacts through competently organized and operated service departments afford perhaps the best opportunity your company has for the building and holding of customer goodwill.

Industrial heat application surveys should be made for the purpose of improving present service and to guide and assist the industrial customer in the proper selection, application, installation, adjustment and servicing of equipment. Under present conditions this should not be left to the equipment manufacturer.

Studies should be made of every possible off-peak and interruptible in-

## 1947 A. G. A. Conference at Cleveland

THE Executive Board of the American Gas Association announces that the Association's twenty-ninth annual convention will be held October 6-8, 1947, at Cleveland, Ohio.

The 1946 convention last fall voted for San Francisco as the next convention city. All indications point to a large attendance at the 1947 convention which under present circumstances would tax the hotel facilities in San Francisco and result in insufficient hotel reservations to accommodate the members of the Association.

After careful consideration of all factors involved, the Executive Board of the A. G. A., meeting in Boston, March 21, deemed it advisable to postpone the San Francisco meeting and voted to hold the 1947 Conference at Cleveland. Announcements covering hotel reservations and other details will be mailed to members of the Association in the near future.

dustrial load which can be secured on a sound basis to balance house heating. Sell your own managements on what can be done in integrating these loads.

While the gas company salesmen are not usually expert process engineers who are called in when major equipment is purchased, they should actively sell standard furnaces. Satisfactory experience and contacts on such installations often pave the way for much larger loads.

I would establish the most effective Public Relations program in the history of my company. That program would make every effort to first provide present customers with adequate supply, improved equipment operation, replacement of faulty or uneconomical equipment, and a practical and workable service policy.

I would use continuously every available medium to make better known to the public my problems, my program and my progress toward rendering better service. I would conduct public opinion surveys and demonstrate my good neighborliness by courteous treatment of customers, my good citizenship by providing the broadest possible service to my town, which is also my customers' town.

I recommend to you the A. G. A. School in Columbus, Ohio, the first week in May. Students will become familiar with processes, equipment, application, market and equipment surveys, fully oriented to the job of industrial equipment and fuel selling. Training will be conducted by men

from the utilities, the manufacturers, the associations, and Ohio State University. I would supplement this course with continued training at equipment manufacturers' plants and within my own organization.

I would establish a scientific control of sales and advertising expenditures. When sales are easy to get, expenditures in most businesses are at a high level. Conversely, when business has been slow and difficult to get, sales and advertising expenditures have been at a low level. To overcome the handicaps of shortages, lack of contact, and the resistances within a buyer's market, selling and advertising pressures should be maintained, perhaps increased during this period of restricted expansion.

The manufacturers' cooperation in this program follows the lines already requested and planned—equipment, technical information, advertising, research. In those things you already have their enthusiastic support.

As a manufacturer of equipment, I look with concern upon the sales restrictions, the time apparently needed to provide an adequate gas supply, and the effect these factors will have upon our future manufacturing policy and equipment sales.

I have every confidence that the men who have assumed the stewardship of the gas industry face the facts with courage and determination to consolidate the gains and continue the service it has so greatly advanced in the past 25 years. Gas has been a dynamic industry. Let's keep it so.





BY HELEN KIRTLAND

*Home Service Director, The Ohio Fuel Gas Co., Columbus, Ohio*

While the following article is addressed directly to home service personnel, it is of interest to all concerned with gas industry sales and service.

**D**OMESTIC gas appliances are engineered by men, built by men, sold by men—and used by women. Perhaps the industry's first acknowledgment of the fact that a liaison officer between the production and distribution man's world of factory and sales-floor and the woman's world of the kitchen and laundry was needed was its establishment of the home service department. Home service took this job over with vim and enthusiasm—and along with it came another: the task of helping the salesman to understand what a woman encounters in her day in, day out job of keeping the family well fed, well clothed and the house clean!

For in a modern, highly competitive world it's no longer enough to use the masculine slant alone in selling. The salesman must understand how the appliances he sells fill the homemaker's needs—perhaps even better than she does herself. He must know how new trends and new features will fit into her homemaking picture, so that her objections may perhaps be answered

Presented at Home Service Workshop, American Gas Association, Cincinnati, Ohio, Jan. 20-23.

## Use the Feminine Slant, Mr. Salesman

Home service can help train salesmen on how new trends and features will fit into the housewife's homemaking picture

even before they are voiced and certainly so that he may answer the claims of competitive equipment.

In my early days I innocently thought that appliances were sold much like perfume. The homemaker decided that the oven door had fallen off and maybe there was something to this time-tested adage about the way to a man's heart so she'd better get another stove in time for father to enjoy Sunday dinner. As a result she went downtown, told a man in the appliance department of her chosen place of business what she needed and he waved the features of the various models he had to sell under her nose. She selected the most glamorous one she thought she could get the man of the house to pay for and it was delivered not later than Saturday afternoon. This gave her Saturday night for trial and error before the Sunday heart-winner.

I hadn't been in the utility business long before I discovered how naive this idea really was and had an interesting glimpse of the masculine slant at work. One of the salesmen took me out on a complaint call. The homemaker was a stout, middle-aged German lady who had a way with apple strudel. After a few minutes' conversation I heard Andy call her "Mother." Startled, I looked at her and watched her delighted beam. I soon saw that if the apple strudel didn't come out right it might be my fault or the range's fault—but Andy was blameless. In case you're interested in how he handled his young and shapely customers he called them Mrs. Brown and Mrs. White just as I did—but he had a different twinkle in his eye than I could manage.

Sex appeal will always be a good selling tool I'm sure, but we've gone beyond that today. Unless a salesman can explain to his prospect the "whys" of many of our appliance uses as well as the "hows," a fair number of these

prospects will be able to give him a "no" when he asks them to sign on the dotted line. I don't mean that he has to be able to fold egg whites into cake batter as skillfully as she does, but I do think it's helpful for him to know a little about what goes into a cake and the skill required to combine it, as well as how to place the pans in the oven to get maximum baking efficiency.

How to accomplish this? It seems to me that it should be a progressive and continuous course of training—perhaps one that your salesman is hardly aware of at times—with occasional special activities to give him renewed interest in the project you are stressing. And this is especially important now, when many sales departments are being rebuilt with new, inexperienced men.

The first step with such new personnel might be to arrange with the sales manager to allot you some time during his training course to go over the appliances with him, much as you would with one of the customers to whom he has made a sale. Explain what your job comprises and how it is designed to help him. Go over the literature with him that you have available for customers and explain how the housewife uses it. He may see possibilities in it as a door opener, perhaps your laundry brochure and stain removal chart will help him tip over a water heater sale because he has approached the homemaker by talking her own language—using the feminine slant. Show him how your kitchen planning service can help him build his unit sales and explain how you go about giving his customers this service.

Step number two might be to take him out on some home calls with you. If it's kitchen planning, tell him you need help in measuring (of course you'll try to select a call where you can show him how you're going to make it possible to increase his business—

even though it may be in the future—while you're helping the homemaker to greater convenience in her kitchen and laundry). Be sure to take him on a sales follow-up call early in the game. He can't help but be impressed at the way you're reselling the equipment by presenting the care and use story on the equipment and he can't help but learn a lot right along with the housewife.

In general I think it's a good idea not to involve salesmen in complaint calls. Usually they are a problem which you and the service department must settle. However every salesman knows that troubles will show up in the best of equipment and when the customer involves him in a complaint he can learn a lot of the hows and whys of equipment problems by accompanying you on the call and watching you discover the cause of the trouble.

A less direct method of acquainting salesmen, new and old, with the feminine slant on use of equipment is to see that one of them occasionally attends your cooking schools. He will be impressed with the easy way in which you turn out delicious and glamorous foods. He will learn much in seeing you handle the appliances he is selling and he will be able to widen the scope of the sales story he presents to future prospects—from the feminine slant. Many of the features explained, and perhaps even the techniques used in cooking schools he will already be familiar with. But perhaps he is only familiar with them from what he has read in the literature which heralded the appliance or from what the manufacturer's representative (also a man) has told him.

### Avoid Extravagant Claims

In giving him the feminine slant it is often possible to prevent his making—in all innocence—extravagant and impossible claims for the equipment. For instance, if he actually sees you turn out a whole broiler meal and hears your story on it as presented at a cooking school, he won't try to use this as a selling tool for Mrs. MacGillicuddy with her brood of eight. Rather, he'll choose the tip he saw last month where all that toast was turned out so evenly browned in such a surprisingly short time. There are countless instances like this where, if he understands fully the uses and possibilities of his appliances, your home call won't be needed to cor-



*Salesmen and home service staff alike are impressed by cooking school demonstrations*



*Practical kitchen planning information carries genuine appeal for the salesmen*

rect false impressions but merely to amplify true ones. And disappointment on the part of the customer will be avoided.

Sales managers who call on their home service departments frequently to present information in the morning sales meetings are helping to acquaint their men with how to use the feminine slant in selling. In planning your presentation to the men remember to make it practical—something they can take out and use soon in a sale. Make it simple. Don't presuppose any fund of appliance or cooking information on their part. And make it complete. Decide what one feature you want to stress at that meeting and tell *all* about it rather than giving a brief over all picture which may be confusing to them because too much information was presented with too little explanation.

Remember, you'll have other chances

with them if you make this meeting worth-while. Illustrate your explanations well. Remember demonstration is your business and "tell plus show" is always stronger than just "tell." Cook some vegetables in a large amount of water and some in a small amount. Contrast the results, the fuel cost and the food value for them. If you can tie in something they will like for an early morning snack with your demonstration they'll be even more impressed with the feminine slant. Coffee will show speed and the ability of your simmer burner to hold gentle heat. Two pans of cookies will show even baking etc., etc.

Of course you'll want to keep them acquainted with your home service plans—your new Kitchen Planning book and all the literature you are developing for use in your presentations to clubs, at cooking schools, in the

home economics departments of the schools and at your home service center. Let them know how many and what kind of telephone requests you answered last month—the women inquiring were their customers. These morning meetings can be one of your best means of presenting home service helps to the sales department.

Occasionally you may want to schedule demonstrations for your sales department. In my own company we presented one as part of a range sales training course the men were taking. In planning it we tried to think of all the superiorities of gas as a fuel over electricity and how we could dramatize these in a demonstration. In addition, we felt that "CP" features should be stressed so that we listed all of these with an eye to making plans for bringing them out to the best advantage. We then planned the demonstration and went over it with the sales manager to make sure we were presenting the information he wanted, to get across, and in such a way that the men would understand it. He OK'd the plan with one addition. He told us that the men's standard of baking performance was a range which would turn out a perfect angel food cake, so that was included.

We made almost no attempt to show mixing techniques but simply those necessary to show range performance. Our intent was to show what it would

do by turning out an amazing array of delicious foods and to do it easily and to perfection. A short explanation of what we were going to do with perhaps some discussion of why it was considered difficult or desirable to prepare and what "CP" or competitive fuel features we were going to bring out preceded the preparation of each item. The meeting was broken by a 15-minute recess in the middle, during which foods completed up to that time were served to the men. This pleasant interlude was useful to us in gauging their reactions to the material already presented. Informal discussions at this time told us whether we needed to emphasize further any of the points already brought out and prepared us for the type of questions we would receive.

A great deal of interest was shown in the cooking performances being demonstrated. In fact so many questions on broiling methods were asked that twice we revised our story on this in order to anticipate many of them and to point up the things we wished to make clear. Although these meetings took place in October, we are still getting comments from the men on how they used the information and what particularly interested them in the program.

A discussion on how to present your sales department the feminine slant for selling wouldn't be complete without suggestions for having the men them-

selves actually do food preparation. It's a lot of work but it's fun for both the men and the home economist. Probably the most popular plan is to time these meetings as a late afternoon project so that the food prepared may be eaten for supper. Careful arranging is needed to see that every one has a task each time that will teach him something about the use of the appliance, to see that all the jobs can have home service supervision and to see that as far as possible all of the men are acquainted with every thing that is being done.

Certainly the results are worth it. The salesman has a new respect for the little woman in the home! If it's all that trouble to turn out meals she certainly ought to be able to use appliances that will make it as easy and fool-proof to do so as possible! Conversely, housewives who hear about these exploits may possibly decide that if a man can turn out a fine meal like that, these ranges must give cooking perfection—and she buys!

You'll find that work with your sales department reaps rich rewards in personal satisfaction. You'll find them calling on you more and more, crediting you with a part in their success and offering you that subtle flattery of considering you an indispensable member of their group. And isn't it fun, in a man's world to have your femininity acknowledged and capitalized?

## How To Be a Good Dictator

● History is replete with good and bad dictators. Greece flourished under the good ones—Rome declined under the bad. There is an equally wide gulf between good and bad dictators in the office—those whose dictation is systemized, clear, and fluent, and those who mumble their words, gallop furiously through dictation, disregarding the ability of the stenographer to take it, and waste their time and their stenographer's because they do not plan their work.

Sales presentations are carefully tailored in the sales department, advertising copy is pruned to harvest the biggest crop of customers, factory operations are timed to save labor cost,—yet dictation in the office too often is handled without plan or system.

To improve his efficiency, the dictator should evaluate his present methods by checking them against the following 12 points:

1. Assign definite hours for dictation. Calling a busy stenographer away from work whenever the urge comes to dictate a letter or two keeps output down. At times this may be necessary, but it can be minimized with careful planning.
2. Have all the information assembled before beginning. Sending a messenger for the data while dictation is in progress holds up work.
3. Spell unusual words and proper names. This minimizes corrections and rewrites. Make yourself responsible for punctuation, grammar, and sentence structure.
4. If possible, dictate where you are least likely to be interrupted. If you can get away from a telephone, do so. Most interruptions are unwarranted and can be postponed.
5. Time your word flow to the stenographer's speed. Some stenographers, particularly new ones, hesitate to ask the boss to put the brakes on his dictation. "I thought you said this" is a common plaint in offices, and in most cases it is due to poor timing of dictation and shorthand speeds.
6. Analyze the letters you've been dictating. Are they too long? Can you cut out excess wordage? Are you employing too many trite expressions or worn-out phrases, discontinuance of which would spruce up your

correspondence? Coverage should be thorough, but modern tempo demands brevity.

7. Form letters or paragraphs should be adopted to convey similar messages and should be turned out by duplicating machine. Often the similarity isn't apparent until the carbon copies of letters written over a prior period are carefully analysed.

8. Write short, informal office memos in longhand. Takes less time than having a stenographer type them.

9. Eliminate trite salutations and closings, such as "We have yours of the 14th," "Thanking you for any attention you give to this matter," etc. Today the recipients of your letters want facts and are not peeved when a letter is trimmed to the bone. It saves them time, too.

10. Consider using window-envelopes to save typing time.

11. If you make a rough draft of an important letter, make all changes the first time. If the final draft requires minor corrections, make them to minimize erasures.

12. Give the stenographer explicit instructions regarding the number of copies, enclosures, rush material, rough-draft work, and the setup of the letter, if unusual.

—Fred Marsh, *The Office Economist*



# Huge Project Will Convert Coal to Gas

**Proposed Pennsylvania plant is expected to produce high B.t.u. gas equal to output of the Big and Little Inch pipelines**

**H**IGH B.t.u. gas fuel in quantities rivalling the output of the Big Inch and Little Inch pipelines may eventually be produced from the conversion of western Pennsylvania bituminous coal deposits under a mammoth research and development program recently announced.

The Pittsburgh Consolidated Coal Co. and Standard Oil Development Co., central technical organization of Standard Oil Co. of New Jersey, will conduct the program, which aims at perfecting commercial processes for making gas, gasoline, Diesel and other fuel oils and industrial alcohol from bituminous coal. Some sources feel that the project may lead to the creation of a new multi-million dollar fuel industry.

First step in the plan, which includes the original survey, fundamental laboratory studies and blueprinting of a pilot plant for the gasification of coal, has already been taken. Arrangements have been made to contribute to the studies of Hydrocarbon Research, Inc., which is also engaged in research on the gasification of coal and production of synthetic gasoline from gas.\*

The pilot plant costing \$300,000 will be erected by the coal company at Liberty, Pa., and should be completed by the end of 1947. It is expected to consume 50 tons of coal a day and produce daily approximately 2,400,000 cubic feet of gas suitable for synthesis into liquid fuels and into a high B.t.u. gas. A year's operation of the experimental plant will be required to provide data needed in determining the size and

structural details of the big commercial plant.

The commercial plant which might cost as much as \$120 million, could be located within 25 miles of Pittsburgh, the coal company officials report, and be ready for operation by 1950-51. It could yield 96 billion cubic feet of gas a year. Production would be at the rate of 400 million cubic feet a day during four winter months and 200 million cubic feet a day in the other eight months.

The two companies plan to apply the fluidized solids technique, a war-developed refinery technique created by the Development Company's scientists.

Commenting on the joint research and development program, Robert P. Russell, president of Standard Oil Development Company, said that if the pilot plant for complete gasification of coal operates as expected, the resulting gas could be converted directly into high octane gasoline, diesel fuels, chemicals, and chemical raw materials by still another process on which the company has been working for several years.

The fluidized solids technique, which was developed originally to improve the quality of motor gasoline, makes possible the production of high B.t.u. gas and liquid fuels from coal. In the process used in the oil industry the catalyst whirls around like a dust storm in tem-

perature close to 1,000 degrees and controls the cracking of oil molecules to give gasoline molecules of the right size and shape for high octane gasoline.

In transforming coal or coke into gas for industrial and household use, the fluidized solids technique performs in almost the same way as it does in the big "cat" crackers of oil refineries. But instead of furiously tossing a clay catalyst around as it does in the cracker, the fluid process this time is used to agitate the powdered coal or coke into a veritable cyclone. The powdered coal, when reacted with oxygen and steam in a generator, forms a mixture of carbon monoxide and hydrogen which is called synthesis gas.

Once the synthesis gas is formed and purified it can be treated by the Development Company's synthesis process where, in a reactor, using the fluidized technique with a catalyst, the synthesis gas can be converted into synthetic gasoline, diesel oil and chemicals.

The reaction in this stage of the process liberates great heat, amounting to 1,800,000 B.t.u. for each barrel of liquid product produced, thus at first posing a difficult problem. As the process was developed in Germany, a catalyst in stationary beds was used. Large numbers of closely-spaced cooling tubes were required and the capacity of the reactors (Continued on page 204)

## A LOOK AT THE OVERLOOKED PLUMBER

**I**S your sales department making effective use—I repeat, effective use—of your architects, builders, the home-economics departments of schools and colleges and of the completely over-looked plumbers?

Let us look at plumber relations and contacts as an outlook and channel for your customer activities involving not only sales but public relations.

It is estimated there are about 15,000 neighborhood or jobbing master plumbers in the United States. In the past these men have been considered more or less service people rather than merchandisers. Yet in 1946, they were responsible for selling nearly \$15 million worth of automatic gas water heaters. They must be recognized as a very important distribution channel. As a matter of fact, two important kitchen appliances—the new automatic sink and dishwasher and the garbage disposal unit—will be largely distributed through the plumbers.

From the standpoint of credit the master plumber has a fine record. It is a very rare

case indeed for a master plumber to quit his profession. During the depression in the early '30's when some of them lost their trucks and showrooms, they operated from their home basements, carried their tools on street cars and for the time being became their own journeymen.

Most electrical or other appliance dealers have generally been informed on the availability of finance credit plans but the plumbers need information and your help in obtaining their share of the consumer's business.

You may not have thought of the plumber as a salesman in the accepted sense, but remember that he sells or can sell a lot of merchandise. He is in a preferred position to do so because of his neighborhood customer contacts and confidence. In your plans to promote the sale of gas appliances you need the plumber and he needs you.—ROBERT E. GINNA, Vice-President, Rochester Gas & Electric Corp., at N.E.G.A. Business Conference.

\* See June, 1946, MONTHLY—"Gasoline from Natural Gas" by P. C. Keith, president, Hydrocarbon Research, Inc., New York.

# Clearer Focus on Research

Executives and scientists call planned analysis least risky, potentially most profitable of industry's capital ventures

BY H. J. HENSE

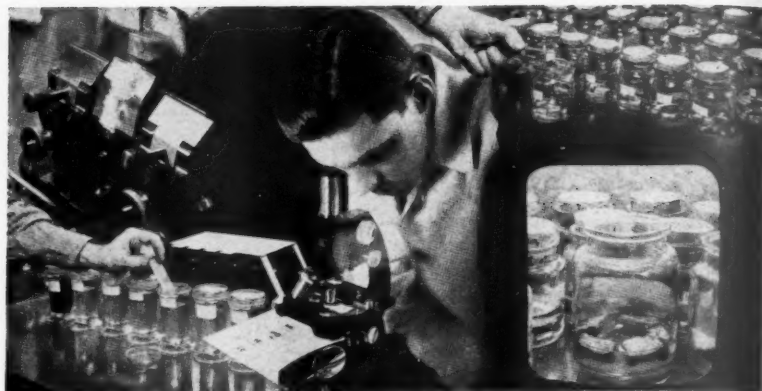
*American Gas Association Testing Laboratories*

MILLIONS of words have been written about the subject of research, but to the layman as well as the average business executive, intelligent comprehension of its place, value and function in the industrial landscape remains largely a hazy vision still to be brought into sharp focus.

In an attempt to compose a better picture of research values and their relation to industry, the Standard Oil Development Co. made its silver anniversary the occasion of a forum on the Future of Industrial Research. The transcript of talks by a number of the country's outstanding executives and scientists, published under that title, cuts a wide swath through the haze that has obscured our vision.

Much of the haze, of course, has been self generated—the natural confusion associated with growing pains. On the other hand, in pleading for better public relations, the late Thomas Midgley, Jr., president and chairman of the board of the American Chemical Society, observed that advertising copy of industrial units promoting their own research endeavors often was damaging to such ends.

"Advertising copy has a way of romanticizing research, putting an air of mystery around the laboratory, calling it a 'Home of Magic' or some other equally intriguing name. By these means the public is led to believe that indus-



*Laboratory research is long, hard work*

trial research is beyond its understanding, and what the public does not understand it fears," he told the forum.

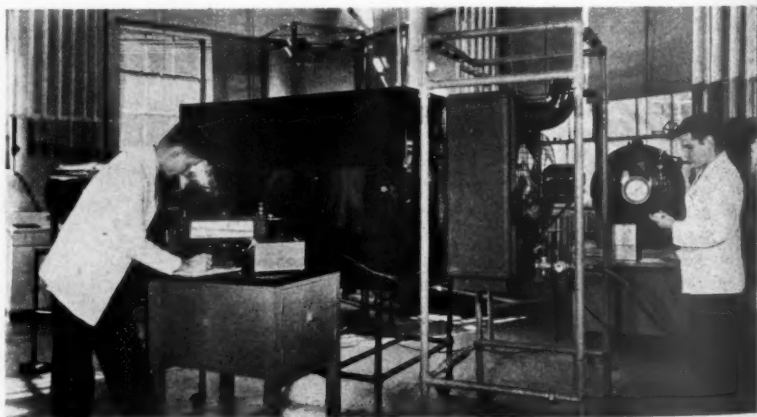
Westbrook Steele, executive director of the Institute of Paper Chemistry, noted that the research accomplishments of World War I led to a condition which he classified as research "worship" rather than understanding of research. During the following decade research was considered a good thing to buy—it was good advertising copy. He expressed his own belief that education of the consumer must be based upon proven facts rather than upon high-pressure salesmanship and wishful thinking, for outlets for increased production capacities must endure.

Whatever the merits of these views, it might well be pointed out that such copy probably has aided materially in establishing research as a valuable tool of progress which will play an increasingly dominant part in our economic

and political future. As Charles F. Kettering has pointed out, science too has muddled the water somewhat with too much pseudo-research which is actually nothing but rephrasing of the same old thing, when what is needed is to explain research in everyday language.

The over-all general confusion probably is responsible in large measure for a rather widespread feeling, even among executives, that industrial research necessarily is a commodity so complex and expensive that only the very large corporation can afford to have anything to do with it. While in the early days following World War I it was the large companies, particularly in the oil, chemical and rubber industries, that pioneered and engaged extensively in research, in reality research cuts across the general structure of all types of businesses, large and small.

Fortunately, various ways and means have been found for smaller industries



*Constant tests are required—then more tests*



and individual firms to capitalize on the value of research and to contribute materially to the well-being of the world and our standard of living. The gas industry, about to enter its second three-year period of intensified research, is at this very time capably harnessing and utilizing such ways and means. The details are familiar to all of us.

The trend towards intelligent utilization of research by a great many more industries and individual concerns undoubtedly will increase sharply as this new adjunct to business comes of age and executives generally acquire a better understanding of its fundamental workings.

Midgley points out that today this infant of 25 years has the tremendous job of catching up with 150 years of industrial progress. It has expanded ten times and 70,000 scientists are now engaged in it. However, Harry L. Derby, president of American Cyanamid & Chemical Corp., holds that coming generations will look back to our day and marvel at the crudeness we displayed in attacking the problems confronting us. World War II has emphasized how directly war moves under the sign of research, discovery and invention and the concept that peace will likewise move under similar signs is rapidly taking hold.

Today's need as seen by Morehead Patterson, chairman of American Machine & Foundry Co., is to interest management, which is always very busy, in the mental habits of research men and to create a positive desire to find out the latest happenings, advancements, new principles, new habits of thought, which it can apply to its own future. He sees the research mind as a new thing, not in point of years, but in point of application to practical problems.

#### Research Least Risky

"Because the methods which science uses, both fundamental and applied, are so powerful and certain in achieving the ends sought," says Frank B. Jewett, retired board chairman of Bell Telephone Laboratories, "money spent through well-organized research and development departments is the least risky and potentially the most profitable of all the expenditures in which industry ventures capital."

Edwin H. Land, president of Pola-

roid Corp., not only indorses this view but states flatly that a research program is never a failure. "Every incident in its history will prove to be an educational factor in the next investigation undertaken. Almost inevitably the research program which appeared to have failed several years ago results in new knowledge that some clever individual finally adapts to his company's needs.

"Thus, the longer a company has been carrying on an extensive research program, the richer relatively that company is. This wealth does not appear on the balance sheet. It manifests itself each time a new demand is made on the company. . . . No matter how thoroughly and promptly the results of the scientific work have been published there remains a somewhat intangible body of material that cannot be published but which the group draws on constantly in its new production efforts.

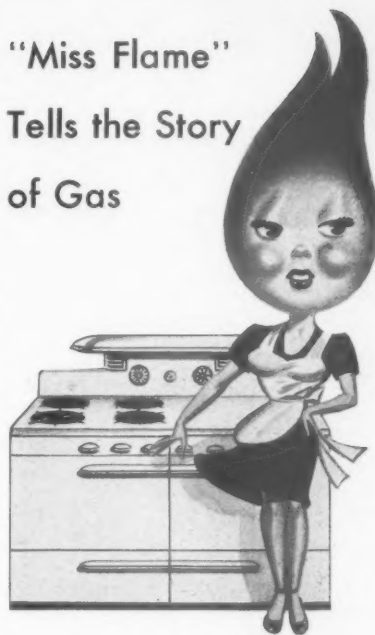
Lammot DuPont explains it this way, "The thing that appears to be useless very frequently turns out to be of great use, and in a way which is entirely unexpected. What is fundamental research today is applied research tomorrow. I believe in the end it will always turn out that way."

How far in advance then, conceding that these views are correct, must one start on research before the salesman can carry the product on the road? Charles F. Kettering answers as follows:

"In our particular line we say we work from ten to 15 years ahead of the product. We call that research. About 25 percent of our total man hours goes into service to our divisions. Another 25 or 30 percent goes into sample making, that is, making working samples which are not products, but from which a product can be designed. The other 45 or 50 percent is spent in long-range pure science, or physical and chemical research, in which we begin to orient into useful information the factors which are not quite in a tangible form."

On the question of collective research by an industry, Steele emphasizes another important phase. "One of the many reasons I endorse an industry's collective research program is that I believe that it is imperative that research be accompanied by a training of men in order that (Continued on page 204)

## "Miss Flame" Tells the Story of Gas



Copyright by American Gas Association

**M**EET "Miss Flame," the little character illustrated above, who will make her first public appearance this month in a 16-page, four-color picture story book, "The History of Gas."

Developed and copyrighted by the American Gas Association, "Miss Flame" was intended originally for use especially in a series of picture story books, the first of which is "The History of Gas." However, several gas companies have already requested permission to use the figure in their local advertising and promotion.

Meanwhile, sample copies of "The Story of Gas" are being mailed to member gas companies by the A. G. A. Promotion Bureau. The advice of nationally recognized educational leaders was enlisted in the preparation of the book which is designed for use in connection with social study and elementary science courses in American schools.

The story begins with the first known use of gas 3,000 years ago in China and follows gas through various stages of development to the present day where it ranks as one of America's largest industries. "Miss Flame" personifies gas throughout the story and serves as narrator of the history.

While the book is primarily designed for children, producers of similar books have found a surprisingly large percentage of adults interested in this story telling form. In most communities, schools welcome such material for use in appropriate classes, particularly when the preparation has been carried out under the guidance of educational authorities, as is the case with "The History of Gas."

One million copies have been printed on the first order and are available at cost through the A. G. A. Promotion Bureau.

# New Requirements For Automatic Gas Ranges



**S**EVENTEEN new minimum requirements for automatic gas ranges built to "CP" standards are effective from January 1, 1947. Each specification is designed to provide high minimum performance and convenience advantages over and above the requirements for gas ranges which meet the basic American Standards Association and American Gas Association Laboratories safety and performance standards.

The following minimum "CP" requirements are taken from a four-page sales-slanted folder which the Gas Appliance Manufacturers Association is making available for distribution to the gas industry and its customers. A technical outline of these requirements and method of test is available from G.A.M.A. in mimeograph form.

## General

**Safety and General Requirements.** All ranges bearing the "CP" Trade Mark must comply with the standard safety and general performance requirements of the American Standards Association Approval Requirements for Domestic Gas Ranges, Project Z21.1-1942 and revisions thereto. Test gases, test pressures and burner capacities must conform with those specified under the American Standard Approval Requirements for Domestic Gas Ranges.

**Flush-to-Back-Wall Construction.** The new "CP" models must fit flush to the back wall, with the exception of kitchen heating (bungalow and combination) models. This gives a harmoniously attractive appearance to streamlined New Freedom Gas Kitchens.

## Ovens

**Wide Range of Heat.** Ovens when empty must maintain temperatures down to 250°. This makes possible low temperature oven cooking, which reduces meat shrinkage up to 20 percent and conserves vitamins and minerals. Maintaining low temperatures evenly and exactly enables the cooking of low-cost cuts of meat to the same delicious, juicy tenderness as more expensive cuts, provides new

cooking methods and makes possible new delicious menus.

**No Matches.** Automatic oven ignition is a popular "CP" requirement. Matches are a thing of the past. Ovens light instantly when the gas is turned on and give full instant heat, to any temperature desired.

**Exact Cooking.** Oven heat controls that maintain any temperature exactly, evenly and automatically, save fuel, save time, and free the cook from oven watching. The new ovens are so exact and so automatic that an entire meal can be cooked perfectly even though the housewife is miles away. In addition, automatic clock controls that turn ovens on and off are available on many "CP" models. Underdone or overcooked meats, pies and cakes are things of the past. The exactness of heat control and the heavy insulation help keep kitchens cooler.

**Cleaner Kitchens.** Oven vents must discharge cooking vapors away from walls in the new "CP" models. This helps keep kitchen walls, ceilings, cabinets and curtains clean and bright.

**Easy to Clean Drawers and Oven Racks.** All drawers and racks must operate quietly and easily, without undue friction or jamming. This makes ovens easier to use by eliminating yanking and pulling of racks and drawers with the danger of spill-overs and tipped utensils.

**No Spilled Food.** Effective stops must be provided for all drawers and racks so they will not tilt or fall out and spill foods and utensils in the oven or onto the floor.

## Broilers

**Smokeless Broilers.** Broiler pans must be constructed so that grease and fats are drained away from the heat zone. This prevents smoking and burning. Rising food vapors are quickly incinerated in the broiler flame. Broiler pans, sides, tops and bottoms are easier to clean and to keep clean. There is no smoke or greasy grime to settle on walls and ceilings.

**Broilers Light Themselves.** A popular fea-

ture of all "CP" models is the automatic broiler ignition. As soon as the gas is turned on, broilers light automatically to give instantly the full heat desired.

**Large, Even Heating Broilers.** In "CP" models, the effective broiler area must not be less than 80 percent of the grill area. This means larger, more effective broiling area with greater economy, convenience, and elimination of hot spots. Delicious broiler meals and new healthful menus are easier to prepare. Food waste is reduced to a minimum.

**Kitchen Walls Stay Bright.** Broiler vents must discharge all cooking vapors away from kitchen walls. No smoke or dirt mars walls and ceilings.

## Top Burners

**High-Low Simmer-Save Top Burners.** All top burners on the new automatic gas ranges built to "CP" requirements must be of the dual or "high-low" type. This makes possible vitamin and mineral-saving minimum water cooking, which cuts vegetable waste up to 20 percent. All top burners give every shade and degree of heat and have a fixed simmer position. Food can be brought to a boil quickly, then cooked at a gentle, controlled temperature that prevents valuable food elements from being boiled away or absorbed in water and poured down the sink.

**Cooks One-Third Faster.** Every "CP" model must have a giant top burner to speed up meal preparations. The minimum requirement for this burner is that, at full heat, it must raise five pounds of water 140° in nine minutes or less. This means a full meal can be prepared much more quickly, and big and little cooking jobs are done in a jiffy.

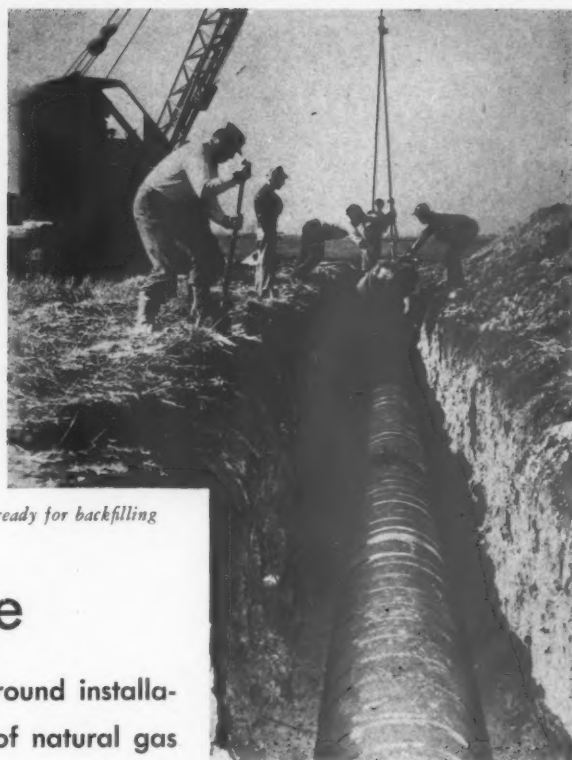
**Automatic Lighting—No Matches.** All burners must light automatically, and thus no matches are needed. Simply turn a handle, and any heat desired is instantly available. It is just as quickly turned off, too. There is no continued or "over" cooking on "CP" top burners after the heat is turned off.

**Easy to Clean and Keep Clean.** All burner heads must be rust-resistant. This means they are as easy to clean as a china plate. Just wipe them off, or take them out and immerse them in water. Spill-overs will not clog the precision-tooled burners. The new burners give pure, stainless heat applied directly to the bottom of utensils so as to give the full benefit of the heat paid for. This not only keeps kitchens cooler and saves fuel, but the exact adjustments keep pans shiny bright. No special cooking utensils are necessary to get the full benefit of the exact heat.

**Greater Speed—Greater Economy.** The high minimum thermal efficiency requirements for top burners provide greater economy and quicker meal preparations, less heat in the kitchen, and savings in time, fuel and money.

## Optional Features

Many manufacturers add to these basic "CP" requirements, additional performance and convenience features developed in their own test kitchens and laboratories.



Right, men placing special pipe in open trench. Left, pipe in position ready for backfilling

## Storage in Buried Pipe

Northern Illinois utility designs unique underground installation having capacity of 1,250,000 cubic feet of natural gas

BY C. R. CLAXTON<sup>1</sup>

M. G. MARKLE<sup>2</sup>

D. V. MEILLER<sup>3</sup>

THE Public Service Co. of Northern Illinois recently placed in operation near Kankakee, Illinois, an underground storage installation for natural gas with a total capacity of 1,250,000 cubic feet. The design of the storage unit was developed by the Illinois organization and consists of 50 lengths of steel pipe, 40 feet long and 24 inches in diameter, in each of which 25,000 cubic feet of natural gas is stored at 2240 pounds per square inch.

This installation, while useful and necessary for continued reliable gas service to the Kankakee area, is also a "pilot plant" to demonstrate the advantages and determine any faults preparatory to making a much larger installation. The gas load of Kankakee and adjacent communities, with 9200 customers, is increasing rapidly because of the increasing population, greater use of gas for

space heating, and an influx of new industries.

The normal supply of gas to the area is through a high pressure distribution feeder main from Matteson, Illinois, some 30 miles north and east of Kankakee. The distribution in the Kankakee area consists of a central low pressure natural gas system where a carburetted water gas plant with two six foot sets and a 500,000 cubic foot commercial lift-type holder are available for emergency use or peak shaving for the low pressure system only. There are no compressors for returning gas to the high pressure system serving the outlying areas and industrial customers.

To assure an emergency supply for high pressure customers and added protection for the low pressure system, in the event of a temporary failure of the feeder main from Matteson, the additional storage of 1,250,000 cubic feet in buried pipe was installed on the opposite side of the city from the normal supply through the feeder main from Matteson. The storage, together with the water gas plant and the lift-type holder, can supply the maximum load of the area during the time needed to



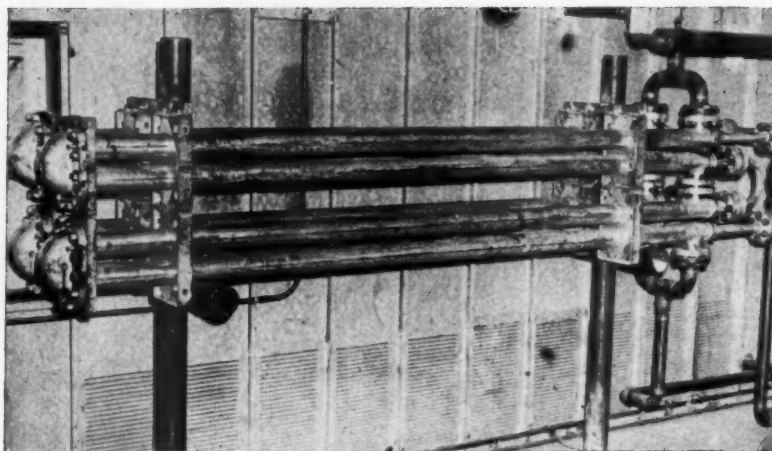
Installing an expansion bend between two lengths of special pipe already in place in their trench. All underground piping is coated and has cathodic protection

<sup>1</sup> Engineer, Process Division, Stone & Webster Engineering Corporation.

<sup>2</sup> Gas Engineer, Public Service Company of Northern Illinois.

<sup>3</sup> Senior Design Engineer, Public Service Company of Northern Illinois.





*Tube within tube heat exchangers are used to heat the high pressure gas with steam before reduction to distribution pressure*

make emergency repairs to the feeder main from Matteson.

Of particular interest in this type of storage is the effect of the compressibility factor, or deviation from the laws of perfect gases, upon the natural gas. Fortunately, the maximum deviation occurs near 2240 pounds and is of such magnitude as to increase the storage capacity by more than 40 percent over that of a perfect gas, the compressibility factor "Z" ( $PV = "Z" NRT$ ) being less than 0.70 at 2240 psi and 40° F. Thus, whereas approximately 160 standard cubic feet of a perfect gas could be stored per cubic foot of space, approximately 230 standard cubic feet of natural gas can be stored per cubic foot of space.

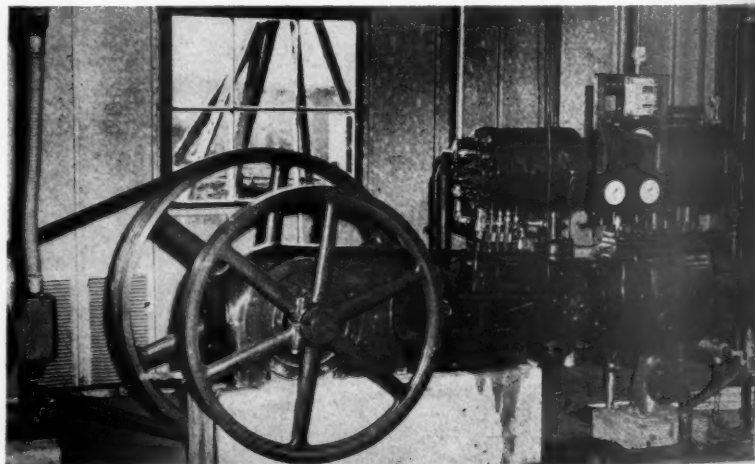
This fact was dramatically demonstrated when ten lengths of special pipe were pressured to 2300 psi with 187,000 cubic feet of air, whereas 260,000 cubic feet of natural gas was required to pressure the same ten lengths of pipe to 2240 psi. Also, a high pressure cylinder was pressured to 2240 psi with natural gas and the gas then carefully metered out in the laboratory. The metered volume was within one percent of the calculated volume.

The nominal storage capacity of the Kankakee installation is 1,250,000 cubic feet, however, the actual gross storage capacity is 1,396,000 cubic feet at 40° F. storage temperature or 1,184,000 cubic feet at 60° F. storage temperature. The net available gas from storage is approximately 25,000 cubic feet less than the gross storage.

The operating pressure of 2240 psi

conforms to the A.S.N.E.A.S.A. Code for Pressure Piping, Section 2, Division 2, and is 80 percent of the mill test pressure of 2800 psi. All piping other than the 24-inch special pipe conforms with Section 2, Division 1, Code for Pressure Piping. To withstand these high pressures, the special 24-inch OD seamless heavy wall pipe was made of A.P.I. N-80 steel which has a yield point of approximately 80,000 psi. The pipe has a minimum wall thickness of 0.448 inches and weighs approximately 5000 lbs. per 40-foot length.

In order to avoid field welding of the N-80 steel, each length of pipe, before shipment to the job, was swaged down on both ends, the ends rough-bored, the pipe stress relieved and tapped on each end with a 1½-inch thread to A.S.A.



*Three-stage compressor for filling the special pipe has capacity of approximately 6000 cubic feet per hour*

specification B 2.1, 1945 Appendix J.

Each length was hydrostatically tested to 2,800 psi in a water-filled jacket, thus permitting the detection of any pipe in which the yield strength had fallen below the minimum of 80,000 psi specified or any section of the pipe which was below the minimum specified wall thickness of 0.448. The 50 lengths of pipe installed at Kankakee averaged 39 feet, 6¾ inches in length, and the average internal volume as determined by weighing when empty and when full of water was 109.66 cubic feet.

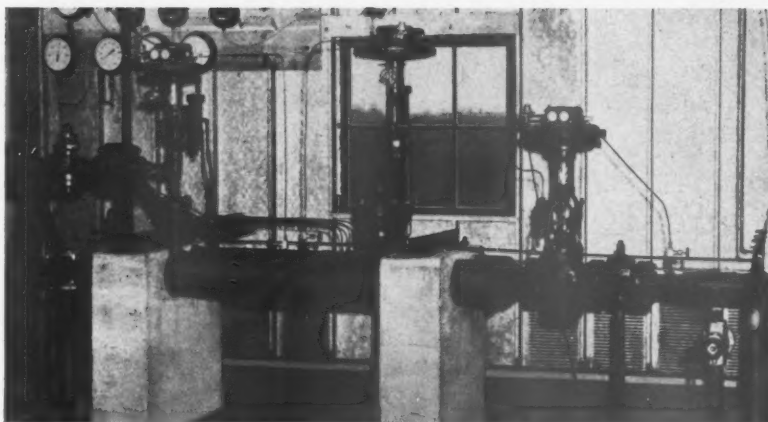
The arrangement of the special pipe was as shown in the pictures on page 171 which illustrate the spacing and arrangement of 40 lengths, which makes up a "standard" one million cubic-foot unit of storage. The spacing between lengths of pipe was selected so as to facilitate installation, and so that a failure of any special pipe will not disturb adjacent pipes. The special pipes were spaced eight feet end-to-end and 15 feet center-line to center-line. At Kankakee 40 lengths were installed as illustrated and the other ten lengths were installed as a part of a future "standard" one million cubic-foot unit. Two valves are installed in the field, one is a shut-off for the "standard" one million cubic-foot unit, and the other is a shut-off for the ten lengths of pipe which in the future may be a part of a second "standard" one million cubic-foot unit. The special pipe has three feet six inches of cover to minimize seasonal temperature changes. All underground piping is coated and has cathodic protection.

The storage installation consists, in addition to the buried special pipe, of a compressor for filling the special pipe, regulators for withdrawing the gas and a boiler and heat exchanger for heating the gas prior to pressure reduction. Since this installation is primarily for emergency use, and quick refilling is not considered essential, the compressor was selected on the basis of availability rather than capacity.

### Gas-Fired Boiler

The compressor is three stage with inter-coolers but no after-cooler, and has a capacity of approximately 6,000 cubic feet per hour at 40 psig suction pressure. A 40 h.p. motor drives the compressor with V belts. The regulators and heat exchanger are designed for a withdrawal rate of 125,000 cubic feet per hour. The regulation which is in three steps, 2240 lbs. to 450 lbs. to 150 lbs. to 40 lbs., has interstage receivers equipped with relief valves. "Choke run" bypasses around the first two stages permit maintenance of flow rate as storage pressure decreases. A cast iron gas-fired boiler with 590,000 B.t.u. per hour input provides low pressure steam for heating the gas ahead of the regulators.

Operating experience to date has been satisfactory. The piping was tested with air at full operating pressure prior to introduction of gas, in order to facilitate safe repair of any leaks. No leaks were found in the 1½-inch threaded joints in the ends of the special pipes. These threads and the 1½-inch male threads of the 1½-inch expansion bends connecting the special pipes were accurately cut and were carefully gauged with special gauges, both at the mill and in the field, and field "make-up" of these joints was carefully supervised. Sample threaded joints had been previously tested and found tight under 3000 pounds gas pressure. Only one leak was found in a weld and no leaks were found in ring gasket flanged joints. A number of leaks were found at threaded joints made with "ordinary" pipe threads. Almost all such joints were then back-welded to insure tightness. Although no aftercooler was used, the temperature of the special pipe rose very little during filling. During a test in which the storage pressure was reduced 1200 pounds in about two hours, the temperature of the gas in storage decreased about 30° F.



*Regulators reduce pressure in three stages from 2,240 pounds per square inch storage pressure to distribution pressure*

This type of storage has many advantages. Since major facilities are underground, they are not subject to storm damage, are little influenced by atmospheric conditions, and there is no hazard to or from aviation. Since storage is in many small units, storage capacity may be added easily in any increments desired, and any unit may be taken out of service for repair or inspection with-

out disturbing the remainder. A high percentage of stored gas is instantly available at distribution pressure. The investment, operating costs and maintenance costs are very attractive as compared to some other types of storage.

It is anticipated that the flexibility and obvious advantages of this type of storage will make it quite popular for certain locations and conditions.

## Steel "Pig" Speeds Pipeline Cleansing

THE "Pig" is an ingenious creature. He travels above the ground or below it. He can go through water and turn corners. He can squeal or he can make a noise like a giant projectile travelling at high speed. He's a wonderful help to the gas industry.

This is what "Pigs" are made of: usually two rubber-tired steel discs connected by a steel axle, resembling a pair of miniature freight car wheels. A "Pig" 18 inches long weighs about 60 pounds. Each robot is so constructed that it has to be forced into the pipeline. Once in place with the pipe welded shut and pressure gradually applied behind it the "Pig" moves at a fast clip.

Some pigs, the type a person sees on a farm, may appear dirty. Opinions differ on the subject. But the fact is that pipeline "Pigs" are unquestionably clean. They spend the greater portion of their lives purging the inevitable accumulation of dirt, stones and wood found in a new gas line, no matter how careful the workmen may have been, until no obstacles remain which could damage the valve seats when a pressure test is made.

"Pigs" often move easily with only about 30 pounds pressure, but sometimes when the going gets rough nearly 200 pounds is needed. A pressure gauge at the point of insertion in the pipeline shows by rise and fall the progress of the cleaning agent to-

ward the open end of the line, often many miles away.

The East Ohio Gas Co., which has used the "Pig" to clean 150 miles of its new 18 and 20-inch steel artery, reports that the robot maneuvers bends in pipelines with incredible ease. Sharp 32-degree bends and extreme over-bends and sag-bends are often part of a day's work as the "Pig" courses through the line pushing along everything in its path. Dirt stirred up by the robot blows freely into the air through temporary breaks in the line at each valve station.

Surprising amounts of debris have been successfully removed by the "Pig." The rolling of big stones in the pipe sometimes can be heard a quarter of a mile away, the East Ohio Company reports, and long, heavy timber used in pipe blocking during construction has been battered to splinters while being forced around short bends.

The "Pig" is not infallible and does get lodged in the pipe on occasion. In such an event a loud squealing usually identifies the trouble spot. Halts caused by "wrinkles" in the pipe show that the "Pig" is also effective as a mechanical inspector. When additional pressure fails to release obstructions the pressure must be shut off and the line vented so that a cut can be made and a section of pipe removed. When the obstacle-

(Continued on page 204)



# Proved Natural Gas Reserves Rise

Joint reporting by A. G. A.-A. P. I. committees marks new method of estimating America's petroleum sources, places natural gas supply at 160.6 trillion cu. ft.

Proved natural gas reserves in the continental United States on December 31, 1946 were 160.6 trillion cubic feet and proved liquid hydrocarbon reserves were 24,194,587,000 barrels, estimated the first joint report of the Committees on Reserves of the American Gas Association and the American Petroleum Institute. The joint report marked a new method of estimating the nation's petroleum sources.

The proved natural gas reserves of 160.6 trillion cubic feet represent an increase of 12.8 trillion cubic feet or about 8.0 percent over proved reserves of 147.8 trillion cubic feet estimated on December 31, 1945. The estimated net production of natural gas for the year 1946 is 4.9 trillion cubic feet after deducting the amount of gas returned to reservoirs.

In view of the importance of these two reports the MONTHLY is printing them both in their entirety.

## A. G. A. Committee Report

THE American Gas Association's Committee on Natural Gas Reserves herewith submits its second annual report, as of December 31, 1946.

The committee estimates that the proved recoverable reserves of natural gas in the United States as of December 31, 1946 approximated 160 trillion cubic feet, classified as follows:

1. Non-associated gas (free gas not in contact with crude oil in the reservoir)  
116 trillion cubic feet
2. Associated gas (free gas in contact with crude oil in the reservoir)  
26 trillion cubic feet
3. Dissolved gas (gas in solution in crude oil in the reservoir)  
18 trillion cubic feet

All volumes have been calculated at a pressure base of 14.65 pounds per square inch absolute, and at a temperature of 60 degrees Fahrenheit. The estimate is detailed by states in Table I. The increase over the committee's previous estimate for December 31, 1945 is accounted for in the table in the adjacent column.

The Committee on Petroleum Reserves of the American Petroleum Institute, has cooperated in the study and

	Trillion Cu.Ft.
Total proved reserves as of December 31, 1945	148
Revisions, extensions and discoveries, 1946	17
Less production during 1946	5
Net increase in reserves during 1946	12
Estimated proved reserves as of December 31, 1946	160

preparation of these estimates of reserves. Frederic H. Lahee, chairman, and the members and subcommittees of that committee, have been exceed-

ingly helpful in this work. The estimates of that portion of the natural gas reserves classified as dissolved gas were contributed to a large extent by that group, who also collaborated generously in the estimates of natural gas liquids, and their efforts are gratefully acknowledged.

Both committees have agreed to use the term "natural gas liquids" to describe those hydrocarbon liquids that are gaseous in the reservoir but are obtainable by condensation or absorption. Natural gasoline, condensate, and liquefied petroleum gases fall in this category. The proved recoverable reserves of natural gas liquids in the United



N. C. McGowen



Lyon F. Terry

## COMMITTEES ISSUING JOINT REPORTS ON RESERVES

### A. G. A. Committee on Natural Gas Reserves

N. C. McGowen, United Gas Corp., *Chairman*  
Lyon F. Terry, The Chase National Bank, New York, *Vice Chairman*  
R. M. Bauer, Southern California Gas Co.  
R. O. Garrett, Arkansas Louisiana Gas Co.  
Charles C. Hoffman, Cities Service Gas Co., Oklahoma City  
Frederick S. Lott, Bureau of Mines, Dept. of the Interior  
W. T. Nightingale, Mountain Fuel Supply Co., Salt Lake City  
Perry Olcott, Humble Oil and Refining Co., Houston  
E. E. Roth, Columbia Engineering Corp., Pittsburgh  
Walter E. Caine, American Gas Association, *Secretary*

### A. P. I. Committee on Petroleum Reserves

F. H. Lahee, Sun Oil Co., Dallas, *Chairman*  
G. Clark Gester, Standard Oil Co. of California, *Vice-Chairman*  
Fred Van Covern, American Petroleum Institute, New York, *Secretary*  
R. F. Baker, The Texas Co., New York  
L. T. Barrow, Humble Oil & Refining Co., Houston  
D. V. Carter, Magnolia Petroleum Co., Dallas  
Frank R. Clark, The Ohio Oil Co., Tulsa  
Alexander Deussen, Consulting Geologist, Houston  
J. M. Sands, Phillips Petroleum Co., Bartlesville, Okla.  
Theron Wasson, Pure Oil Co., Chicago  
Fred E. Wood, Standard Oil Co. (Indiana), Chicago

States are estimated, as of December 31, 1946 to be approximately 3,354 million barrels. These reserves are classified in the same manner as the gas from which they are extracted, as detailed in Table II and summarized below:

1. Non-associated	1,924 million barrels
2. Associated	573 million barrels
3. Dissolved	857 million barrels

Proved reserves of natural gas as herein used include the gas in both the drilled and certain undrilled portions of the fields. The undeveloped areas considered to have proved reserves are those so located with respect to the field geology and structure that production therefrom is practically assured. Recoverable reserves of natural gas are the reserves estimated to be producible under existing operating practices. The recovery factors or abandonment pressures used differ as widely as the characteristics of

each field and the economics of each region considered.

Proved recoverable reserves of natural gas liquids are those estimated to be contained in recoverable gas reserves and to be extractable by methods now in use.

The committee wishes to stress the fact that it is endeavoring to give an accurate and unbiased appraisal of the reserves of natural gas and natural gas liquids in the United States. With this aim, each district chairman has appointed several subcommittees to gather and study the available data for his district. The men selected to serve as subcommittees are especially trained geologists and engineers. The committee expresses its appreciation to those men who so generously gave their time and efforts to the preparation of this report and to the companies and individuals who made available their data and records.

## A. P. I. Committee Report

At the meeting of this committee in February 1946, J. Edgar Pew resigned both as chairman and as a member of the committee, and Frederic H. Lahee was named chairman to succeed Mr. Pew.

In November, news of the death of Mr. Pew came as a severe personal loss to every member of this committee. Since its organization in 1936, Mr. Pew had always been greatly interested in the results of the committee's work, and he as well as all other members, had consistently maintained, first, that the estimates made by the committee should be limited to proved reserves only, and second, that the reports of this committee should be restricted to factual information.

With deep regret, also, during its present session, the committee learned

TABLE I  
ESTIMATED PROVED RECOVERABLE RESERVES OF NATURAL GAS IN THE UNITED STATES  
(Millions of Cubic Feet)

	Reserves as of Dec. 31, 1945	Changes in Reserves During 1946			Reserves as of December 31, 1946			
		Discoveries, Extensions and Revisions	Net Production	Net Increase	Total	Non- associated	Associated	Dissolved
Alabama	23	75	1	74	97	0	0	97
Arkansas	869,686	54,171	52,195	1,976	871,662	447,651	162,276	261,735
California	10,855,707	803,056	532,462	270,594	11,126,301	3,687,430	3,198,714	4,240,157
Colorado	396,282	(—) 70,905	9,614	(—) 80,519	315,763	155,440	41,075	119,248
Illinois	268,000	33,500	33,500	0	268,000	3,000	55,000	210,000
Indiana	17,000	3,200	3,200	0	17,000	4,000	8,000	5,000
Kansas	13,250,605	636,771	206,532	430,239	13,680,844	13,257,617	212,310	210,917
Kentucky	1,436,800	44,200	95,000	(—) 50,800	1,386,000	1,299,000	0	87,000
Louisiana	19,849,393	3,170,050	607,932	2,562,118	22,411,511	18,323,314	2,697,126	1,391,071
Michigan	8,931	148,069	26,000	122,069	131,000	76,200	0	54,800
Mississippi	2,007,859	383,842	21,188	362,654	2,370,513	1,731,821	446,098	192,594
Montana	1,202,521	(—) 319,521	29,599	(—) 349,120	853,401	853,401	0	0
Nebraska	375	(—) 374	0	(—) 374	1	0	0	1
New Mexico	5,190,309	899,737	185,260	714,477	5,904,786	3,079,900	2,132,911	691,975
New York	76,000	900	7,000	(—) 6,100	69,900	69,000	0	900
Ohio	626,800	46,200	59,000	(—) 12,800	614,000	573,000	0	41,000
Oklahoma	10,079,938	1,311,816	655,908	655,908	10,735,845	7,572,279	1,589,538	1,574,028
Pennsylvania	520,000	61,000	78,000	(—) 17,000	503,000	453,000	0	50,000
Texas	78,306,676	10,154,021	2,097,238	8,056,783	86,363,459	62,345,192	15,282,025	8,736,242
West Virginia	1,928,300	116,700	205,000	(—) 88,300	1,840,000	1,739,000	0	101,000
Wyoming	816,763	252,379	33,545	218,834	1,035,597	693,191	235,176	107,230
Miscellaneous <sup>1</sup>	81,399	265	4,443	(—) 4,178	77,221	76,900	0	321
Total	147,789,367	17,729,152	4,942,617	12,786,535	160,575,901	116,440,336	26,060,249	18,075,316

<sup>1</sup>Includes Florida, Missouri and Utah.

Notes: Volumes are reported at a pressure base of 14.65 pounds per square inch absolute, and at a standard temperature of 60° F.  
Net production equals estimated gross withdrawals, less gas reinjected into underground reservoirs.  
Reserves of dissolved gas were estimated jointly with the A.P.I. Committee on Petroleum Reserves.

**TABLE II**  
**ESTIMATED PROVED RECOVERABLE RESERVES OF NATURAL GAS LIQUIDS**  
**IN THE UNITED STATES AS OF DECEMBER 31, 1946**  
(Thousands of Barrels)

	Non-associated	Associated	Dissolved	Total	1946 Production
Arkansas	41,071	8,306	12,223	61,600	3,457
California	40,328	107,300	160,644	308,272	21,885
Colorado	775	410	1,192	2,377	200
Illinois	—	—	34,200	34,200	3,900
Indiana	—	—	85 <sup>1</sup>	85	16
Kansas	80,202	1,140	1,150	82,492	1,991
Kentucky	16,071 <sup>1</sup>	—	—	16,071	1,310
Louisiana	330,466	75,019	13,911	419,396	13,500
Michigan	—	—	655 <sup>1</sup>	655	309
Mississippi	17,212	34,095	192,594	243,901	108
Montana	8,534	0	0	8,534	108
New Mexico	27,697	30,950	14,962	73,609	2,818
Ohio	1,714 <sup>1</sup>	—	—	1,714	143
Oklahoma	45,597	10,020	12,700	68,317	9,875
Pennsylvania	2,309 <sup>1</sup>	—	—	2,309	262
Texas	1,292,177	296,072	397,357	1,985,606	66,134
West Virginia	19,285 <sup>1</sup>	—	—	19,285	2,400
Wyoming	458	9,400	15,600	25,458	846
Miscellaneous <sup>2</sup>	—	—	6 <sup>1</sup>	6	—
<b>TOTAL</b>	<b>1,923,896<sup>2</sup></b>	<b>572,712<sup>2</sup></b>	<b>857,279</b>	<b>3,353,887</b>	<b>129,262</b>

<sup>1</sup>Not allocable by types, but occurring principally in the column shown.

<sup>2</sup>Approximate total; see footnote one.

<sup>3</sup>Includes Alabama, Florida, New York and Utah.

of the death of Robert T. Wilson, of the Gloria Corp., Corpus Christi, Texas.

In 1945, the directors of the American Gas Association authorized the formation of a "Committee on Natural Gas Reserves" to prepare estimates of U. S. proved reserves of natural gas and its derived liquids in the United States. Arrangements were made for cooperation between the A.P.I. Committee on Petroleum Reserves and the A. G. A. Committee on Natural Gas Reserves whereby (1) the whole field of proved hydrocarbon reserves would be covered, and (2) there would be no duplication of effort.

The first report of the A. G. A. Committee was submitted and published in October 1946. It covered only proved reserves of natural gas in the United States as of December 31, 1945. It did not cover estimates of reserves of the natural gas liquids. However, in its second report, the A. G. A. Committee includes estimates both of natural gas and of natural gas liquids, and these estimates are for reserves as of December 31, 1946.

In past years your committee has included in its estimates not only reserves

of crude oil but also certain condensate reserves. Because of the growing importance of condensate reserves and production resulting in greatly increased work in their yearly estimation, such work was taken over by a separate group, the A. G. A. Committee on Reserves, which has prepared the estimate of condensate contained in this report. The A.P.I. Committee on Reserves has continued to make the estimates of crude oil reserves. As of December 31, 1946, the committee estimates that the proved reserves of crude oil in the United States, exclusive of condensate, amounted to

20,873,560,000 barrels. This is shown in Table A.

The estimates in this report, as in all previous annual reports of this committee, refer solely to proved or blocked-out reserves. They include only oil recoverable under existing economic and operating conditions.

In Table B we show, in column 1, our published figures of last year, which included cycle plant and lease condensate. In column 2 we show only the crude oil portion of last year's estimates. In column 3 are the changes in these crude oil estimates due to extensions and revisions. In column 4 are the new reserves of crude discovered in 1946 in new fields and also in new pools (reservoirs) in old fields. In column 5 are shown the committee's figures on production of crude oil, and in column 6 are the remaining reserves of crude oil as of December 31, 1946.

In our reported proved reserves as of December 31, 1944, we showed a total of 668,701,000 barrels of condensate and 19,784,530,000 barrels of crude oil, making a total of 20,453,231,000 barrels. As of December 31, 1945, we showed 884,967,000 barrels of condensate and 19,941,846,000 barrels of crude oil, making a total of 20,826,813,000 barrels. Analogous figures for December 31, 1946 are 1,050,794,000 barrels of condensate and 20,873,560,000 barrels of crude oil, making a total of 21,924,354,000 barrels. In other words, this figure of 1,050,794,000 barrels of condensate for December 31, 1946, is the A. G. A. Committee's present estimate of condensate reserves in the same fields which were included in previous years by the A.P.I. Committee.

If comparison is made between new oil reported in 1946 with new oil re-

**TABLE A**  
(Barrels of 42 U. S. Gallons)

Total proved reserves of crude oil (exclusive of 884,967,000 bbl. of condensate) as of December 31, 1945.....	19,941,846,000 bbl.
Revisions of previous estimates .....	+1,254,705,000
Extensions of old pools .....	1,158,923,000
New reserves (new pools) discovered in 1946.....	244,434,000
<b>Total proved reserves as of December 31, 1945 and new proved reserves added in 1946 .....</b>	<b>22,599,908,000 bbl.</b>
Subtract production during 1946 .....	1,726,348,000 bbl.
<b>Total proved reserves of crude oil as of December 31, 1946.....</b>	<b>20,873,560,000 bbl.</b>
Increase in crude reserves since December 31, 1945.....	931,714,000 bbl.

<sup>1</sup> Where condensate is produced and run with the crude oil, it is treated as crude oil in these estimates.

ported in earlier years, it should be remembered that the 1946 figures for new oil do not include new condensate which is estimated to be approximately 205,000,000 barrels.

The estimates made for this report by your committee do *not* include:

- (1) Oil under the unproved portions of partly developed fields.
- (2) Oil in untested prospects.
- (3) Oil that may be present in unknown prospects in regions believed to be generally favorable.
- (4) Oil that may become available by secondary-recovery methods from fields where such methods have not yet been applied.
- (5) Oil that may become available through chemical processing of natural gas.
- (6) Oil that can be made from oil shale, coal, or other substitute sources.

Proved reserves are both drilled and undrilled. The proved drilled reserves, in any pool, include the oil estimated to be recoverable by the production systems now in operation, whether primary or secondary, and from the area actually drilled up on the spacing pattern in vogue in that pool. The proved undrilled

reserves, in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

In the case of new discoveries, which are seldom fully-developed in the first year and in fact for several years thereafter, the estimates of proved reserves necessarily represent but a part of the reserves which may ultimately be assigned to the new reservoirs discovered each year. For a one-well field, where development has not yet gone beyond the discovery well, the area assigned as proved is usually small in regions of complex geological conditions, but may be larger where the geology is relatively simple.

In a sparsely-drilled field the area between wells is only considered to be proved if the information regarding the geology of the field and the productive horizon is adequate to assure that such area will produce when drilled. The total of new oil through discoveries esti-

mated as proved in any given year is comparatively small and the total of new oil through extensions is comparatively large. As knowledge of the factors affecting production and well performance becomes available, and as these factors are studied, reserves in older fields can be estimated with greater precision and revised accordingly. Therefore, the oil assigned to new discoveries, plus the oil proved through extensions, comprises the total quantity of the new proved reserves for the year.

The committee again wishes especially to stress the fact that its estimates of proved reserves cannot be used as a measure of the rate at which these reserves can be produced with or without physical waste. Oil cannot be produced from the permeable rocks in which it occurs at any desired rate, because the flow of oil through the pores of the oil-bearing rocks is definitely controlled by the physical factors of the reservoir. As a matter of fact, today's known oil can be recovered (*Continued on page 203*)

TABLE B  
ESTIMATED PROVED RESERVES IN THE UNITED STATES  
(Barrels of 42 U. S. Gallons)

	<i>Estimates of Proved Reserves of Crude Oil plus Condensate (December 31, 1945) as Indicated in Committee's Report of February 1946</i>	<i>Proved Reserves of Crude Oil (Condensate Not Included)</i>				<i>Proved Reserves as of December 31, 1946 (Columns 2+3+4 less Column 5)</i>
		<i>Proved Reserves as of December 31, 1945</i>	<i>Changes in Proved Reserves Due to Extensions (New Oil) and Revisions During 1946</i>	<i>Proved Reserves in New Pools Discovered in 1946<sup>1</sup></i>	<i>Production During 1946</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Alabama	785,000	785,000	109,000	—	382,000	512,000
Arkansas	303,674,000	287,623,000	4,172,000	1,764,000	26,501,000	267,058,000
California	3,409,948,000	3,318,006,000	276,787,000	13,876,000	315,178,000	3,293,491,000
Colorado	259,830,000	259,830,000	51,265,000	800,000	12,025,000	299,870,000
Illinois	349,620,000	349,620,000	72,452,000	4,606,000	75,414,000	351,264,000
Indiana	41,243,000	41,243,000	7,878,000	1,633,000	6,684,000	44,070,000
Kansas	541,846,000	541,846,000	87,319,000	12,629,000	96,478,000	545,316,000
Kentucky	56,721,000	56,721,000	13,066,000	88,000	10,687,000	59,188,000
Louisiana	1,689,781,000	1,558,891,000	207,018,000	25,857,000	139,969,000	1,651,797,000
Michigan	64,186,000	64,186,000	21,576,000	415,000	17,000,000	69,177,000
Mississippi	267,160,000	257,363,000	34,939,000	1,790,000	23,871,000	270,221,000
Montana	108,474,000	108,474,000	2,576,000	2,000,000	8,804,000	104,246,000
Nebraska	500,000	500,000	665,000	—	290,000	875,000
New Mexico	512,373,000	512,373,000	65,000,000	2,871,000	36,791,000	543,453,000
New York	81,189,000	81,189,000	—	—	4,900,000	76,289,000
Ohio	29,681,000	29,681,000	3,047,000	—	3,508,000	29,220,000
Oklahoma	889,839,000	888,839,000	98,423,000	47,731,000	136,807,000	898,186,000
Pennsylvania	110,601,000	110,601,000	—	—	13,100,000	97,501,000
Texas	11,470,294,000	10,835,257,000	1,441,158,000	126,594,000	756,649,000	11,646,360,000
West Virginia	38,630,000	38,630,000	—	—	2,975,000	35,655,000
Wyoming	600,131,000	599,881,000	25,919,000	1,780,000	38,222,000	589,358,000
Miscellaneous <sup>2</sup>	307,000	307,000	259,000	—	113,000	453,000
Total United States	20,826,813,000	19,941,846,000	2,413,628,000	244,434,000	1,726,348,000	20,873,560,000

<sup>1</sup>Only a limited area is assigned to each new discovery even though the committee may believe that eventually a much larger area will produce, for in this report the concern is only with actually proved reserves.

<sup>2</sup>Includes Florida, Missouri, Tennessee, Utah and Virginia.



# Natural Gas Department Spring Meeting



R. H. Hargrove



Robert W. Hendee



Irving K. Peck



L. T. Potter

**R**EGULATION and conservation will be the theme of the annual spring meeting of the American Gas Association's Natural Gas Department at the Stevens Hotel, Chicago, April 30-May 1. Advance registrations forecast a large attendance.

A comprehensive, well-timed program has been developed by a committee under the chairmanship of Floyd C. Brown, president, Natural Gas Pipeline Company of America, Chicago, and the following committee members: A. F. Bridge, vice-president and general manager, Southern Counties Gas Co., Los Angeles; Gardiner Symonds, president, Tennessee Gas and Transmission Co., Houston, and C. H. Zachry, president, Southern Union Gas Co., Dallas.

Two morning general sessions will be devoted to discussion of problems of management by leaders in their fields. A. G. A. President Hargrove will touch upon important developments in Association activities and the industry's problems in holding its advanced position in the fuel markets of the future.

Timely discussions will be held on Well-Head Price Fixing with the present conflict of jurisdictions. The future of the house heating load will be handled by a panel of experts. The conservation problem will be discussed by the chairman of the Interstate Oil Compact Commission, and Flare Gas

Wastage by the chairman of the Texas Railroad Commission.

In conjunction with pipeline operations the matter of Underground Storage will be presented by a committee to show the growth of this type of reserve capacity and present-day operations of the systems.

The present status of research developments within the natural gas industry will be presented by the chairman of the A. G. A. Technical and Research Committee, and a special treatment of a project on Pipe Line Flow research will be presented by a representative of the Bureau of Mines.

Afternoon sessions will be devoted to open meetings of the A. G. A. Transmission Committee with a program covering important engineering and technical developments. The A. G. A. Accounting Committee will meet in an open session to discuss accounting problems peculiar to the natural gas industry.

Robert W. Hendee, second vice-president of the Association and chairman of the A. G. A. Natural Gas Department, will preside at the general sessions.

The tentative program is as follows:

## GENERAL SESSION

**Wednesday, April 30, 10:00 A.M.**

Welcome by Mayor of Chicago

The Industry Looks Ahead. R. H. Hargrove, president, American Gas Association, vice-president and general manager, United Gas Pipe Line Co., Shreveport, Louisiana

Well-Head Price Fixing. Glenn Clark, vice-president and general counsel, Cities Service Gas Co., Oklahoma City

Interim Report by Subcommittee on Pipeline Flow. J. William Ferguson, natural gas engineer, United States Bureau of Mines, Amarillo, Texas

Problems of the House Heating Load—A Summarization of Experiences and Policies in Various Sections of the Country. Irving K. Peck, vice-president and general manager, The Manufacturers Light and Heat Co., Pittsburgh

**Thursday, May 1, 9:00 A.M.**

Research and Development Progress. H. D. Hancock, chairman, A. G. A. Technical

and Research Committee; president, Gas Advisers, Inc., New York

What is Being Done to Eliminate Flare Gas Wastage. Ernest O. Thompson, chairman, Texas Railroad Commission, Austin

Conservation as Viewed by the Interstate Oil Compact Commission. Hiram M. Dow, chairman, Interstate Oil Compact Commission, Roswell, New Mexico

Underground Storage Symposium. Presiding: L. T. Potter, chairman, A. G. A. Production and Storage Committee; assistant to president, Lone Star Gas Co., Dallas (Discussion leaders to be announced.)

Closing Remarks. Robert W. Hendee, chairman, A. G. A. Natural Gas Department; second vice-president, American Gas Association; president, Colorado Interstate Gas Co., Colorado Springs

## TRANSMISSION COMMITTEE MEETING Wednesday, April 30, 2:00 P.M.

Interesting Features of the 30 Inch California Line Now Under Construction. F. A. Hough, executive engineer, Southern Counties Gas Co., Los Angeles

Operating Experiences with Angle Type Compressors. O. H. Moore, assistant to vice-president, Tennessee Gas and Transmission Co., Houston, Texas

Some Experiences in the Aerial Patrol of Pipe Lines. G. F. Leamon, in charge of pipeline aerial patrol for Northern Natural Gas Co., and Panhandle Eastern Pipe Line Co., Omaha 1, Nebraska

## TRANSMISSION COMMITTEE MEETING Thursday, May 1, 2:00 P.M.

Gas Turbines and Centrifugal Compressors, also Brief Review of Accomplishments and Developments in Jet Propulsion. Representative of Allis-Chalmers Company

Availability of Propane and Propane Tank Cars, also The Need for Storage in Propane-Air Plants. Herbert Bartholomew Phillips Petroleum Co., New York

## ACCOUNTING COMMITTEE MEETING Wednesday, April 30, 2:00 P.M.

The following subjects will be discussed: Depletion Accounting, Tax Problems Peculiar to the Natural Gas Industry, Accounting For and Tax Treatment of Geological, Geophysical, and Exploratory Drilling Costs, Various Methods of Treatment in the Accounts of the Companies of Tax Reductions Resulting From Deductions of Intangible Drilling Costs, Job Training Programs for Natural Gas Company Accounting Personnel, Job Evaluation Programs for Natural Gas Companies, Merits of Centralized vs. Decentralized Billing of Customers, Uniform Classification of Accounts for Natural Gas Companies, Classification of Accounts for Propane Plants.

## Organ Notes

● The *Successful Employee Publication* (Breth-Bilken), outlines six important purposes which any employee organ should accomplish:

1. Integrate employees and management.
2. Integrate departments within the company organization.
3. Give recognition for individual and group accomplishment.
4. Educate employees about the industry.
5. Educate employees about company products.
6. Bridge the gap between the job and home.

—Stet



## I. G. T. Extends Coverage of "Gas Abstracts"

TO fulfill one of its major objectives, the dissemination of information to the gas industry, the Institute of Gas Technology began the publication of "Gas Abstracts" in 1945. Since then every effort has been made to extend the coverage and increase the value of the publication.

"Gas Abstracts" is issued monthly and consists of excerpts from current articles in gas technology and closely-related fields. Various technical and trade journals, society transactions and bulletins and publications of Governmental bureaus and departments are reviewed promptly. Several English journals are included and French and German publications will be added when available. Approximately 120 sources are covered.

Articles pertaining to production or manufacture, distribution, transmission or storage, and utilization of natural and manufactured gas and related subjects are selected for abstracting by staff members of the Institute of Gas Technology. When possible the significance of the article to the gas industry is stressed, and occasionally the abstractor adds pertinent information or interpretation.

The abstracts are grouped under 12 headings and arranged alphabetically by subject in each group, as shown below:

1. *The Gas Industry*—General information and news items, statistics, business regulations and other articles of general interest.
2. *Appliances—Domestic and Commercial*—Burners, ranges, cooking equipment, air conditioning equipment, water heaters and other gas appliances for domestic and commercial use.
3. *Combustion and Industrial Furnaces*—Combustion of gaseous, liquid and solid fuels, design of industrial furnaces, control of furnace atmospheres.
4. *Carbonization and Gasification*—Manufacture and purification of producer gas, blue



Cover view of "Gas Abstracts"

gas, carburetted water gas, synthesis gas; carbonization and gasification of coal and gasification of oil.

5. *Natural Gas and Natural Gas Condensates*—Production, transmission, distribution and storage of natural gas and natural gas condensates; distribution of LP gas mixtures; carbon black and chemicals from natural gas and natural gas condensates.

6. *Petroleum and Synthetic Liquid Fuels*—Production, refining-cracking, alkylation, isomerization, and utilization of petroleum and production of synthetic liquid fuels by the Fischer-Tropsch reaction and hydrogenation.

7. *Analytical Methods and Tests*—New and improved methods pertaining to gas-making materials, processes, products and by-products.

8. *General and Physical Chemistry*—Data on chemical and physical properties of ele-

ments and inorganic compounds, new reactions and new methods for carrying out established reactions.

9. *Organic Chemistry*—Data on organic compounds closely-related to the gas industry, new reactions and methods.

10. *Chemical Engineering*—Data and methods of possible application in the gas industry, such as fluidization, heat transfer and unit operations.

11. *Process Equipment and Instrumentation*—Information concerning new or improved equipment for process operation and control.

12. *Materials of Construction*—Developments in refractories, heat and corrosion resistant materials, new alloys.

13. *New Books*—Reviews of recent books pertaining to gas technology.

"Gas Abstracts" is circulated without charge to member companies of the Institute, contributors and sponsors of research and to others, on a fifteen dollar annual subscription basis. A permanent binder for the year's issues is provided with each subscription.

As an additional service initiated this year, the Institute will provide copies on 5 x 8 cards of abstracts included in the booklet. These cards are cross-indexed according to subjects and senior author. A complete set of subject and author cards may be obtained for ten dollars.

The staff will continue to provide microfilm or photostatic copies of articles and to make literature surveys on a cost plus basis as either are requested.

### Periodicals Abstracted

American Gas Association Monthly  
American Gas Journal  
American Petroleum Institute Quarterly  
American Society for Testing Materials Bulletin  
Analytical Chemistry  
Bituminous Coal Research  
British Abstracts  
British Coal Utilization Research Association  
Monthly Bulletin  
Butane-Propane News  
Canadian Chemistry and Process Industries  
Canadian Gas Journal  
Ceramic Age  
Chemical Abstracts  
Chemical and Engineering News  
Chemical Engineering  
Chemical Engineering Progress  
Chemical Industries  
Chemical Reviews  
Chemistry and Industry  
Coke and Smokeless Fuel Age  
Combustion  
Construction Methods  
Corrosion  
Corrosion and Material Protection  
Engineers' Digest  
Fuel in Science and Practice  
Gas  
Gas Age  
Gas Appliance Merchandising  
Gas Journal  
Gas Research Board Publications  
Gas Times  
Gas World  
Great Britain Fuel Research Intelligence Station Abstracts  
Heating and Ventilating  
Heating, Piping and Air Conditioning  
Industrial and Engineering Chemistry  
Industrial Gas  
Industrial Heating  
Institution of Gas Engineers:  
Bulletins, Communications  
Transactions  
Instruments  
Iron Age  
Journal of the American Chemical Society  
Journal of Applied Mechanics  
Journal of Applied Physics  
Journal of Chemical Education  
Journal of Chemical Physics  
Journal of the Chemical Society (London)  
Journal of the Institute of Fuel  
Journal of the Institute of Petroleum  
Journal of Organic Chemistry  
Journal of Physical Chemistry

(Continued on page 204)

## Home Service Aids Army Palates



Virginia Krietmeyer and Lucile Boettcher, home economists, and Louise Bohn, center, head of The Laclede Gas Light Co. home service department, St. Louis, shown in the gas utility's kitchen helping officers and non-coms of the Army Food Service to prepare meals according to civilian standards



*Claude Jarman, Jr., learns a few top range secrets from Culver City chef*

**C**LARK GABLE, Walter Pidgeon, and Robert Taylor all go for the same dish. We don't mean by this that Hollywood has cooked up a new quadrangular version of the old love triangle. What we are trying to say is that Gable, Pidgeon and Taylor all like steaks—big ones—and for lunch, mind you.

If you want your wife to look like Lana Turner, try feeding her scrambled eggs and toast. That, we learn, is Lana's favorite luncheon. Greer Garson is especially fond of tripe, boiled English style. These are but a few of the fascinating, straight-from-the-feed-box, bits of information we gleaned on a recent trip to the Metro-Goldwyn-Mayer Studio commissary in Culver City, where we went ostensibly to look over the new, all gas, cooking equipment.

Claude Jarman, Jr., the eleven-year-old Dixie schoolboy who scored so brilliantly as "Jody" in the Pulitzer prize story, "The Yearling," is no problem to MGM cooks. He has the typical, healthy, American-boy appetite for hamburgers and malted milks.

Six-foot-three Walter Pidgeon likes a man-sized salad with his two-inch-thick steak. Gable starts with a hearty bowl of soup. Bob Taylor likes his New York-cut rare with lots of catsup, a bowl of stewed tomatoes, and plenty of black coffee.

But don't get the idea that a moving picture studio dining room is a gourmand's paradise where favored person-

# Hollywood Cooks with Gas

Thousands of MGM stars and starlets are served daily from modern, all-gas kitchen equipment in huge studio commissary

ages can indulge their appetites without consequence. Movie stars have their dietary problems too.

Take Jimmy Durante for example. While his colossal proboscis may actually have been an aid in climbing the ladder of fame and fortune, poor "Schnozzle" can't peddle his stomach trouble. Of tolerated dishes, seafoods are his favorite, especially rex sole.

Spencer Tracy likes to tie into a Dutch lunch-plate with cold sliced ham, liverwurst and all the rest, but like Gable, Tracy is currently battling the weight bugaboo. They must forego favored viands in favor of lamb chops and sliced tomatoes, which incidentally seems to be the standard weight reducing combination at the studio commissary.

Red Skelton will eat anything and everything on the menu, but he, too, is haunted by the specter of adiposity, and must practice restraint.

Stars, of course, aren't the only ones catered to in this busy dinery. Special tables are reserved in the main dining room for each of the many departments. Cameramen sit at one table, writers at another, directors at a third, etc. The Sound Department, Music Department, and Art Department each has its own special table.

In addition to the main dining room, which seats about 325, there is a coffee shop with a seating capacity of 78. A private dining room for Louis B. Mayer is located just off the main dining room, and a separate kitchen and dining room is maintained for producers and executives in the administration building, which has been named the Irving Thalberg Building. Tray service is also rendered to dressing rooms and to the sets.

All in all, some 3,000 people are served daily between seven in the morning and eight in the evening. About 1,800 of these pour in during the luncheon period. They must be served promptly, and there can be no compromise with quality. Time is valuable, and those photogenic faces and figures didn't

get that way on indigestible, poorly-cooked foods.

Charged with the responsibility of catering to the many and varied tastes of this diversified group and of serving them without delay is Commissary Manager Bert Baker. Under him is a staff of some 100 cooks, waitresses and other culinary workers.

Head Chef is Felix Ganio, who has been at MGM for five and a half years. Felix, who formerly served at the Trocadero, Ciro's, the Vendome, Earl Carroll's and the Beverly Hills Hotel, completed his apprenticeship in the Romano Hotel in London. Later he was chef at the Hyde Park Hotel there. The discriminating diners whom he serves at MGM will tell you that he is absolute tops in his profession.

In his broad experience in the world's very best dining places Felix has cooked with all of the more commonly used fuels. "Natural gas," he maintains, "is far the best. It's much cleaner and faster than other fuels, and it's much more flexible." It is certainly put to a rigid test in this kitchen where quality, quantity and speed are all so important.

## Heavy-Duty Gas Ranges

Modern, all-gas equipment has recently been installed in the MGM Commissary kitchen to replace that which has served so faithfully for the past ten years. A battery of five heavy-duty gas ranges holds the spotlight on this set. Rounding out the all star cast are two large gas broilers, a 48-inch and a 30-inch griddle, a large self-contained stock kettle, three steam roll warmers, a steam cooker, seven coffee urns, and a dish washer. A three-deck gas bake oven is all that remains of the old retinue.

The menu is different each day and provides a wide variety of dishes. Baker tells us that regarding "temperament" among the stars, the bigger they are, the easier they are to please. Everyone seems content with dishes listed on the

regular menu, and no requests are made for others specially prepared.

A regular luncheon is served ranging in price from 50 cents to 95 cents. This includes soup, hot entree, dessert and drink. Steaks and chops are charcoal broiled and range in price from \$1.00 to \$1.85. Pies, cakes and pastries are baked in the commissary's own bakery.

Daily specials are served on the luncheon and are very popular. On Monday it's Hungarian goulash; Tuesday, chicken pot pie; Wednesday, corned beef and cabbage; Thursday, Irish lamb stew; Friday, corned beef hash, and Saturday, roast tom turkey.

One of the most popular dishes on the menu is the MGM special chicken broth. This soup is so rich with chicken that it costs about four times as much as the price charged. The rich broth is served with either noodles or rice and is chuck-full of shredded, white chicken meat.

### Real Chicken Soup

There is an interesting story behind this specialty. It seems that during the period when Louis B. Mayer was still a struggling young man, there was a time when he was so poor he practically subsisted on soup. In those days when his appetite was always hunger-sharpened, he particularly relished a steaming bowl of chicken noodle soup. It was then that he made up his mind that if he ever had the money, he would have a restaurant that would serve the best chicken soup it was possible to make, and that it would be served free of charge. Here in the MGM commissary he serves that dreamed-of soup. There is no point in serving it free here, but the charge is far below its cost.

Now, just in case you're getting hungry and are possibly planning to run out to MGM for a bowl of that chicken soup and other of Felix's specialties, we're sorry to have to report that you'll have to change your plans. For obvious reasons, the commissary must be reserved for employees of the studio, unless perchance you happen to be a gas man who wants to take a look at that battery of gas ranges and, just ever so incidentally, at Lana Turner.

*Commissary's popular coffee shop seats 78 persons and has a complete turnover every nine minutes. All-gas cooking equipment is used*

ISSUE OF APRIL 1947



*Glamour enjoying a well-cooked meal at MGM Commissary*



*Costumed actors take time-off in Commissary dining room*



*Chef Felix Ganio and his chief pride—five heavy-duty gas ranges*



## New Electronic Igniter Makes Gas Heat Systems Completely Automatic

**A**N electronic system which gives complete automatic control of gas-fired heating units, eliminating the necessity of igniting or turning off pilots at the beginning and end of the heating season, has been perfected by the Minneapolis-Honeywell Regulator Company.

Operated by a thermostat in a convenient part of the house, the Electronic Protectorelay combines a control circuit and an electronic network which, in connection with a suitable flame electrode, provides ignition and flame-safety control of an automatic electric-gas-pilot or a direct-ignited gas burner. The electric ignition functions each time the controller calls for heat and is instantly returned upon momentary flame failure. Safety shutdown occurs on ignition failure or loss of flame.

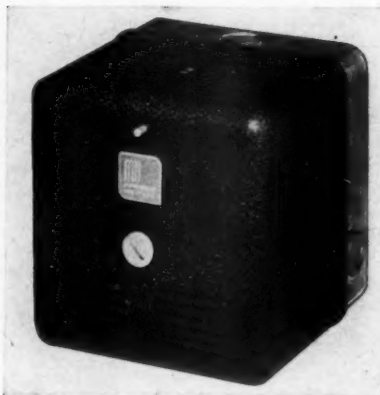
The Protectorelay consists of an electronic amplifier network and tube, two relays, a safety switch with manual reset, the necessary power supply transformer and provisions for making electrical connections.

It includes three main parts: a junction-box sub-base, a molded plastic case and a drawn-metal cover with ventilating louvers and external reset button. The plastic case has separate recesses for the transformer, the safety switch, the two relays and the main part of the electronic network.

Other parts of the system are a thermostat, gas valves, flame-igniter electrode, flame-detector electrode, ignition transformer and fan or limit controls.

The flame-igniter and flame-detector are electrodes combined with a gas pilot and mounted directly on the gas burner for "indirect" or pilot ignition, or built directly into the main gas burner without a separate pilot for "direct" ignition.

With the "indirect" system, ignition to the main burner is controlled through a gas pilot which is lighted by the ignition system



*Little "black box" makes gas burners completely automatic*

and remains on during the burner operation. Flame detection by means of an electrode provides complete interlocking of the control system so that gas cannot be supplied to the main burner until the pilot flame has been proved through the electronic network.

With the "direct" system, ignition is accomplished directly to the main burner without a pilot or pilot valve and flame detection is from the main burner itself by means of a flame detector electrode. If the burner is not lighted within a few seconds, the main gas valve is closed.

### S. G. A. Short Course

**A** SECOND annual Short Course in Gas Technology will be sponsored by the Southern Gas Association at Texas College of Arts and Industries, Kingsville, May 27-30. Two sections of study have been an-

nounced. "Technical Problems in Transmission" is the subject of the first section, headed by R. M. Hutchinson, research director, Houston Natural Gas Corp., assisted by W. C. McGee, Jr., the Tennessee Gas and Transmission Co., Houston, as vice-chairman.

The other section, with the subject "Technical Problems of Gas Utilization," is being arranged by George Elmer May, New Orleans Public Service, Inc., assisted by C. A. McKinney, United Gas Corp., Houston.

### Record Natural Gas Line to Detroit Area

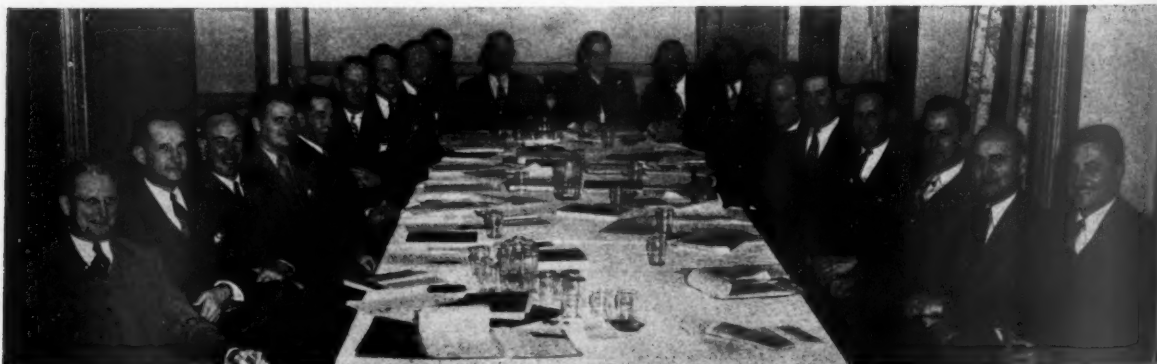
**C**ONTRACTS for construction of a record 1,800-mile natural gas pipeline, to bring gas from Northern Texas to Detroit, Milwaukee and other industrial centers in Michigan, Wisconsin, Iowa and Missouri, have been let by Michigan-Wisconsin Pipe Line Co. and Austin Field Pipe Line Co., operators, to Ford, Bacon & Davis, engineers.

Initial construction cost will be upwards of \$52 million and ultimate development is expected to result in a total investment of \$85.6 million. Actual construction is planned in the latter part of the year. Ultimate delivery capacity will be 325 million cubic feet of gas daily. When ultimate capacity is reached there will be about 142,500 horsepower of compressor capacity installed in stations servicing the line.

The main line will start from a point in northern Texas in the Hugoton gas field and extend in a general northeasterly direction to a point near Joliet, Ill., at which junction one main line branch will extend north into Wisconsin, where it is planned to serve Milwaukee, Madison and other cities.

A second main branch will circle the lower end of Lake Michigan, then run northeast to the Austin Gas Storage Field near Grand Rapids and on to Detroit. In Michigan the system will also serve Grand Rapids, Muskegon and Ann Arbor. The Austin Gas Field will be used for storage purposes.

## Southwestern Gas Measurement Short Course Committee



*Planning Southwestern Gas Measurement Short Course scheduled to be held at the University of Oklahoma, Norman, Okla., May 6-8*



## Texas Moves To Avert Natural Gas Waste

The order would halt the flow of oil and gas until what is commonly known as flare is used for light or fuel, for chemical manufacturing except that of carbon black, for repressuring or for extraction of natural gasoline, with the residue returned to the producing horizon.

Questioning the native owner, he learned the war story of this American-made gas

Mr. Eversman has served as industrial relations manager of the plant since 1945 and will retain this position along with his new responsibilities.

*How  
to make  
a house—a home*

**—AUTOMATICALLY!**

It takes a heap of cooking to make  
a house a home. That's why the high-  
"CP" cooking performance ratings  
of the new Automatic Gas Ranges make  
a house more "home".

To give homeowners a good and safe,  
an efficient cooking range,  
to offset fire, smoke and ventilation  
problems, gas ranges are  
"automatic" gas ranges built to  
burning gas more efficiently  
to "CP" standards are available  
in a wide variety of styles and models.  
That is why many owners feel every  
important feature is included in the  
range and ready to go to the store,  
find and install.

To simplify the time and  
and to make sure it's right a system.  
That's why the "CP" is not important  
to find out for the better choice.

*For Close details consult your gas  
installers, the manufacturers list or  
your local gas utility. Write for a  
free "CP" Gas Range Buyer's  
Bible, Box 12, N. P.*

*Automatic  
Gas Ranges!*

*CP*

**LOOK FOR THE "CP" SEAL ON YOUR  
FAMOUS AUTOMATIC GAS RANGES**

**A-B • CALORIC • DETROIT JAHN,  
ESSEX HEATLON, GAFFERS & FATTLE  
BALLARD • GLENWOOD • GLARE  
HARDWICK • MARIC CHOF •  
MORRIS • OCEANVIEW • REXITY  
QUALITY • ROSES • S&S-ACORD  
PACIFIC • SPAC • TAYLOR • UNION  
WILSON • WESTING •**

*By Courtesy • GLARE BROS. • JEFFAT*

**GAS** THE WONDER FLAME FOR AUTOMATIC COOKING

## Salesmen-Chefs Master Culinary Secrets



In the newly completed "Blue Flame Room" each man baked cakes, prepared whole

Harold E. Jalass, general sales manager, said that the meeting inaugurated the return of the firm's education program for retail salesmen, where the superiority of gas as a cooking fuel is demonstrated and proven at the point-of-sale.

## Gas Service Crews Dispatched by Radio

A NEW two-way short-wave radio system recently installed by The Brooklyn Union Gas Co. has proved effective as a time-saver in the dispatch and control of special service crews.

Three special service trucks have been equipped with short-wave radio equipment by Link Radio Corp and 17 other cars, 12 of which will also be special service trucks, are to be equipped. Twenty-five special service men have been instructed in the use of the equipment.

The company's licensed station, WNVG, operates on 39.98 megacycles. The control unit, a 250 UFS Link type main station, with an output of 250-400 watts and operating on 110 volt, 60-cycle AC current, has been installed. Special service dispatchers, who have qualified for a third-class license, will operate the transmitter.

The car radios, upon which the men will receive the messages and report, are known as number 35 FMTR 6-A mobile units and are designed to operate on 35 to 40 watts.

A qualified mechanic holding a second-class license will maintain the short-wave equipment. Frequency modulations (FM) radio is the system being used—the most modern in the radio field.

The car radios have already shown their value in many cases, enabling Brooklyn Union men to be on the scene only a few minutes after word of an emergency is re-



Thomas Schecker, chauffeur, receiving a message over The Brooklyn Union Gas Co. short-wave radio as Edward Cantwell, serviceman, prepares to handle the emergency

ceived from a customer, the fire or police departments.

The equipment is simple to operate. The car radios and the control unit are equipped with hand sets, resembling telephone hand sets, into which the men speak. The message can be received either over the telephone receiver or a loud speaker. The loud speakers are kept on whenever the men are in the cars in order to catch any message from the dispatcher.

## "Steak Tonight!—Broiled with Gas!"



Radiant personality of little Jessie Crown has won her a place on Southern California Gas Co. billboards. She is being photographed above with her first billboard as a background. Shown, left to right, are Roscoe Carver, McCann-Erickson; M. Kilkelly, Foster & Kleiser; Homer Laughlin, So. Cal. Gas Co.; Joe Eastman, McCann-Erickson; J. S. Spanliding, So. Cal. Gas Co.; Jessie Crown; Miss Vance, studio assistant; Preston Duncan, photographer; Charles Potts

## Convention Calendar

### APRIL

- 1-2 •P. C. G. A. Home Service Workshop, Timberline Lodge, Timberline, Oregon.
- 7-9 •A. G. A.—E. E. I. Accounting Conference, Hotel Statler, Buffalo, N. Y.
- 7-9 •Mid-West Gas Association Annual Meeting, Hotel Paxton, Omaha, Neb.
- 14-16 •G.A.M.A. Annual Meeting, Drake Hotel, Chicago.
- 14-16 •A. G. A. Distribution and Motor Vehicle Conference, Hotel Cleveland, Cleveland, Ohio.
- 16 •A. G. A. Southwest Personnel Conference, Buena Vista Hotel, Biloxi, Miss.
- 16 •S. G. A. Home Service Workshop, Buena Vista Hotel, Biloxi, Miss.
- 17-18 •Southern Gas Association, Hotel Buena Vista, Biloxi, Miss.
- 25-26 •Gas Meters Association of Florida, Georgia, Boca Raton, Fla.
- 28 •American Trade Association Executives Spring Meeting, Hotel Statler, Washington, D. C.

### MAY

- Apr. 28-May 1 •U. S. Chamber of Commerce Annual Meeting, Washington, D. C.
- Apr. 30-May 1 •A. G. A. Natural Gas Department Spring Meeting, Stevens Hotel, Chicago.
- 5-9 •A. G. A. Industrial Gas School, Hotel Seneca, Columbus, Ohio.
- 6-8 •Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla.
- 12-16 •A. G. A. Commercial Gas School, Washington, D. C.
- 15 •New England Gas Association, Operating Division, Hotel Sheraton, Worcester, Mass.
- 15-16 •Indiana Gas Association, French Lick Springs Hotel, French Lick.
- 20-22 •Pennsylvania Gas Association, Wernersville, Pa.
- 22-23 •Canadian Natural Gas and Petroleum Association, Royal Connaught, Hamilton, Ontario.
- 26-29 •National Fire Protection Association, Palmer House, Chicago.
- 27-29 •Liquefied Petroleum Gas Association, Hotel Sherman, Chicago.

### JUNE

- 2-4 •A. G. A. Joint Production and Chemical Committee Conference, Hotel New Yorker, N. Y.
- 9-11 •Canadian Gas Association, General Brock Hotel, Niagara Falls, Ontario.
- 16-19 •American Society of Mechanical Engineers Semi-Annual Meeting, Chicago.
- 23-24 •A. G. A., N. Y.—N. J. Sales Conference, Essex and Sussex Hotel, Spring Lake, N. J.

### JULY

- 7-8 •Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

### SEPTEMBER

- 23-25 •Pacific Coast Gas Association, Hotel Del Coronado, San Diego

### OCTOBER

- 6-8 •A. G. A. Annual Convention, Cleveland, Ohio.

# Accounting Section

L. V. WATKINS, Chairman

JOHN A. WILLIAMS, Vice-Chairman

WALTER E. CAINE, Secretary

## John Doe Gets His "Dough"

JOHN DOE wants his "dough" on payday and he doesn't mean maybe. He may be a clerk in the billing department at the head office or a pipe-fitter working with a crew 150 miles away from the payroll department. Just the same he wants action on payday—action in the form of "dough"—folding money—or its equivalent—and no "ifs" or "buts." Talk about "The mails must go through"—that doesn't begin

BY JOHN A. WILLIAMS  
Ass't Controller, Niagara Hudson  
Power Corp., Syracuse, N. Y.

to compare in importance with the necessity of getting John Doe's pay-check out on time.

In a company such as ours, with 9,000 employees spread over a territory of more than 20,000 square miles, the operation of

getting the time reports in, preparing the payroll and payroll checks and having the checks in the hands of the employees within six days of the last work day, presents some serious problems.

There are a number of important links in the chain between the actual work and the posting of the distribution charge to the proper sub-ledger account. The most important link is the record of original entry—

FORM 301-3-34		DIV. OR DIST.		SYRACUSE ELECTRIC		GROUP NO. 123		FROM 11-17-46 TO 11-23-46		WEEK NO. 47	
TIME REPORT		PAYROLL		NAME, GROUP & EMPLOYEE NO.		HRS. WED. 11-23-46		EXTRA REG. HRS. 11-23-46		WEEK NO. 47	
ACTUAL HOURS WORKED		HOURS PAID FOR		OVERTIME		PREMIUM		OTHER		AMOUNT	
S	M	T	W	T	F	S	RES.	O.T.	WED.	THU.	FRI.
8	A	A	8	8							
JOHN H JONES 123-1010						24	40				
8	X	X									
WILLIAM J SMITH 123-1011						40	40				
8	8	8	8	8					22	1	20
ARTHUR A BROWN 123-1020						44	40	4	7	77	
8	8	8	10	10							
WILLIAM E GRANT 123-1024						36	40				
4	8	8	8	8							
JOHN A ROGERS 123-1025						32	32				
8	8	8	8	8							
TOTALS						176	192	4			
NOTE: FOR THIS ILLUSTRATION ONLY - A DENOTES - ABSENT SICK - FIRST WEEK H DENOTES - EXCUSED ABSENCE - WITH PAY X DENOTES - EXCUSED ABSENCE - WITHOUT PAY G DENOTES - TEMPORARY TRANSFER X DENOTES - TEMPORARY UPGRADING ITALICS denote OFFICE EMPLOYEES											
36 32 32 34 42						TOTALS					
DISTRIBUTION						TRANSFORMATION					
LOCATION, BRIEF DESCRIPTION OF WORK AND ACCOUNT NO.						GROUP CAR MI. OR FT. HRS. TOT. RATE AMOUNT					
James St. - Install wires						DAILY BY ACCOUNT					
355.00 4601 21 0011 1						1 2 557 2 4-3 12 .22 2 64					
Valley Drive - Transfer						1 2 557 2 2-4 12 .22 2 64					
X Arms & Gump						1 2 557 2 2-4 12 .22 2 64					
Valley Drive - Install Pole						1 2 557 2 2-3-2 9 .22 1 88					
+ X Arms						1 2 557 2 2-3-2 9 .22 1 88					
Valley Drive - Transfer & repair wires						1 2 557 2 2-3-2 9 .22 1 88					
741.05 0 15 2100 1						1 2 557 2 2-3 6 .22 1 32					
Rear St. - Remove X Arms & Pole						1 2 557 2 2-3 6 .22 1 32					
144.12 4601 21 0011 1						1 2 557 2 2-4 12 .22 2 64					
James St. - Install Transformers						1 2 557 2 2-4 12 .22 2 64					
740.08 0 15 2100 1						1 2 557 12 12 .22 2 64					
Center St. E. Syracuse Repair Service						1 2 557 12 12 .22 2 64					
741.09 0 15 2100 1						1 2 557 12 12 .22 2 64					
TIMEKEEPER						TOTAL BY CAR FOR THE WEEK					
FORWARD OR SUEV						1 2 557 12 12 .22 2 64					
John H Jones						1 2 557 12 12 .22 2 64					
BROUGHT FORWARD FROM CONTINUATION SHEET ATTACHED						1 2 557 12 12 .22 2 64					
REPORT TRANSPORTATION FOR ACCOUNTS RECEIVABLE WORK IN BOTH BILLS AND HOURS						1 2 557 12 12 .22 2 64					
TOTALS						1 2 557 12 12 .22 2 64					
40 40 40 32 40 192 261.92						1 2 557 12 12 .22 2 64					

Fig. 1—Time Report. Actual size 8½ by 11 inches

WAGE RATE CONTROL		DIVISION OR DISTRICT		SYRACUSE		GROUP NO.		123	
PAYROLL		ELECTRIC		NAME, GROUP & EMPLOYEE NO.		HOURS		WEEKLY RATE	
DATE PROB. TO REGULAR	DATE GROUP CHANGE	DATE ADDED, REMOVED OR RATE CHANGE				WED.	THU.	FRID.	SAT.
				JOHN M JONES	123-1010	40	40	64	80
				WILLIAM J SMITH	123-1011	40	40	59	20
		6-2-46		ARTHUR A BROWN	123-1020	40	40	43	40
				WILLIAM E GRANT	123-1024	40	40	47	40
				JOHN A ROGERS	123-1025	40	40	47	40

DATE	1-1-46	6-2-46							
WEEKLY RATE	266	20	266	20					
+			4	40					
-									
NET	266	20	270	60					

Fig. 2—Wage Rate Control Report. Actual size 8½ by 11 inches

WEEKLY REPORT—TEMPORARY UPGRADING				WEEK ENDING	
FORM 931-42				11-23-46	
TO PAYROLL DEPT:					
GROUP NO.	COMP. NO.	NAME			
123	1011	William J. Smith			
THE WAGE RATE OF ABOVE EMPLOYEE SHOULD BE INCREASED FOR THE DAYS MARKED "X" ON THE ACCOMPANYING TIME REPORT, AS HIS ASSIGNMENT WAS CHANGED.					
FROM	JOB TITLE	JOB NO.	PAY GROUP	STEP	RATE
TO	Line Foreman "A"	1010	21	1	62 20
ON THE FOLLOWING DAYS (MARKED X)					
S	M	T	W	T	F
	X	X			
REPLACING			John H. Jones		
REASON			Illness		
BY			APPROVED		
J.H. Jones			BDD		
FOREMAN			DEPT. HEAD		
			11-21-46		

Fig. 3—Temporary Upgrading Report. Actual size 3 by 5 inches

DEDUCTION RECORD															FORM 937-12	
INITIALS	GROUP NO.	EMPLOYEE NO.	DAYS WORKED	CREDIT UNION	COMMUNITY WELFARE	RED CROSS	GROUP INSURANCE	UNION DUES	BANK ACCOUNTS	EMPL. ASSOC.	HOSPITALIZATION	CORE ACCOUNTS	FISH & GAME CLUB	MISCELLANEOUS	TOTAL	
AAB	123	1020	200		25		104	25		06					360	
WEG	123	1024		40			96	25		06				13	487	
WEG	123	1024												15	100	
JAR	123	1029	100		15		96	25		06					242	
			9600	3300	750		3398	975		246		1660		1100	21039	

COMPANY OR DISTRICT: CENTRAL NEW YORK POWER CORPORATION PERIOD: Ending: NOV 23 1946 SHEET NO. 2

Fig. 4—Deduction Record. Actual size 14 by 17 inches

the time report. We have used pay-books, daily time reports, weekly time reports for individuals and various combinations, but find that the weekly gang time report used for the past nine months meets our needs best of all.

Figure 1 is a copy of this time report. The top half is a record of the time worked by days and the variations from normal hours and earnings for each member of the gang or group. The bottom half, and following continuation sheets where necessary, carry the performance record of the gang, what automotive equipment they used and to what accounts their work and transportation should be charged.

The weekly time report is sent out from the central office with the heavy printed figures entered by addressograph and is returned at the end of the week after the pen and ink figures have been entered by the department head, foreman or time-keeper. The payroll department enters with pen and ink the figures appearing on the sample in "italics."

The payroll department maintains a wage-rate control for each gang, Figure 2. The regular amount earned is not entered on the time report but any variations, indicated on the wage-rate control, are entered.

If an employee works on a higher-rated job for a day or more, a "temporary upgrading report," Figure 3, is submitted with the time report and proper entry for the additional earnings is made thereon. (See second line on Figure 1.)

After the payroll department has made computations for all adjustments for individual earnings for members of the gang, the total earnings for the gang are computed and entered in the right-hand column on the upper half of the report. Average gang rates for the regular and overtime hours are computed and distribution extensions are made on the lower half of the report. The time reports are then forwarded to the tabulating department where payrolls, payroll checks and payroll distribution summaries are prepared.

Alphabetical tabulating equipment is used for preparation of the payrolls and payroll checks. Master cards are maintained for the normal or base-hours and amount of earnings. Adjustment cards are punched for over-



**CENTRAL NEW YORK POWER CORPORATION**  
SYRACUSE, N. Y.

NOV. 23 1946      NO. 87623

PAY EXACTLY 52 DOLLARS 47 CENTS \$52.47

TO THE ORDER OF  
**ARTHUR A BROWN**  
161 MAPLE ST  
SYRACUSE N Y

LINCOLN NATIONAL BANK AND TRUST COMPANY  
SYRACUSE, N. Y. 50-46

**VOID**  
AUTHORIZED SIGNATURE  
PAYROLL ACCOUNT

CENTRAL NEW YORK POWER CORPORATION  
EMPLOYEE'S RECEIPT

COMP. NUMBER		EMPLOY. NUMBER	
1020		112346	
DAY EARNED	T. & TAX	HOUSE TAX	OTHER TAX
5957	160	290	360
5247			

RETAIN THIS RECEIPT AS A RECORD OF YOUR INCOME TAXES AND SOCIAL SECURITY TAXES DEDUCTED FROM YOUR GROSS EARNINGS AND PAID TO UNITED STATES TREASURY ACCORDING TO LAW.

Fig. 5—Pay-check and stub. Actual size of check  $3\frac{3}{8}$  by  $8\frac{3}{8}$  inches

NAME		STATUS	OCCUPATION GROUP AND EMPLOYEE NO.	REG. RATE	TOTAL HOURS WORKED	PAID FOR REGULAR	AMOUNT EARNED	D. & S. TAX	DEDUCTIONS INCOME TAX	OTHER	AMOUNT PAID	CHECK NO.
JOHN N JONES	LINE FMN 123-1010			5480	24	40	6480	2	750	570	5160	87821
WILLIAM J SMITH	LINEMAN C 123-1011			5920	40	40	6040	603	500	480	5000	87522
ARTHUR A BROWN	LINEMAN B 123-1020			5180	44	40	5957	604	290	360	5247	87623
WILLIAM E GRANT	LINEMAN A 123-1024			4740	36	40	4760	471	630	567	3196	87524
JOHN A ROGERS	DRIVER GRNDMN 123-1025			4740	32	32	3752	385		242	3472	87525
<b>TOTALS</b>							1856766	17938	142680	152250	1543898	

COMPANY OR DISTRICT: **SYRACUSE ELECTRIC**

PERIOD ENDING: **NOV 23 1946**

DATE PAID: **NOV 23 1946**

CHECK NO: **9**

Fig. 6—Payroll. Actual size 14 by 17 inches

time, other additional earnings, lost time, etc.

A master file of "other" deduction cards is maintained for all employee deductions, other than social security and withholding taxes (one card to an employee) and is used each week in the preparation of the weekly payroll. After changes have been entered on the deduction cards, a weekly run is made, Figure 4, and balanced with the controls.

A preliminary payroll tabulation is made using the master earnings cards, lost-time cards, additional earnings cards and deduction cards, for the purpose of proving the accuracy of the cards and of producing a summary card. This summary card contains the pay-check number, total earnings, deductions (other than taxes) social security tax and net pay (before withholding tax). The pay-check number is summary-punched from a register which advances one for each operation; the social security tax is summary-punched from a register which is wired two places to the left of the wage total; and the withholding tax is gang-punched by means of a set of master tax deduction cards.

The payroll summary cards, the master name cards, the street cards, and the city cards are sorted together by employee number and are run through the alphabetical tabulating machines for the preparation of the pay-checks, Figure 5. The address cards

are then sorted out and the payrolls, Figure 6, are run on the same machines.

The standard work-week throughout the system runs from 12:01, Sunday morning, to the following Saturday, midnight. Most of the time reports arrive in the Division Office Monday morning. A few straggle in Monday afternoon and the remainder Tuesday morning. Under the procedure described, the payroll and pay-checks (including all overtime and deductions for lost time) are

completed by Thursday night. The checks are either mailed Thursday or are placed in "sure hands" for distribution Friday, still within the six-day statutory limit required in New York State.

Three other records still have to be completed:

1. Labor distribution summaries
2. Unemployment insurance and social security reports
3. Earnings records

EMPLOYEE TO WHOM PAID (Name, Address, Social Security No., and Payroll No.)

**RICHARD E BURGESS** **EMPLOYEE'S COPY**

1110 EUCLID AVE  
SYRACUSE 10 N Y

105011986      789

1	2	3	4	5
Total Wages (before payroll deductions) paid in 1946	Federal Income Tax (if any)	Earnings upon Which Social Security Taxes Were Computed	Social Security Taxes Deducted	
1 54080	5850	54080	546	
2 45437	4540	34528	349	
3 56498	6330	56498	569	
4 67315	8326	67315	676	
2233302	5046	212621	2140	

EMPLOYER BY WHOM PAID

**CENTRAL NEW YORK POWER CORPORATION**  
900 Edo Bldg. West  
SYRACUSE 3, NEW YORK      15-0018885

Social Security Taxes are not allowable as a deduction or credit on your income tax return.      App. R.I.R. 5-30-46

Form W-8      **WITHHOLDING STATEMENT — 1946 DUPLICATE**  
U. S. Treasury Department  
Internal Revenue Service      Wages Paid and Income Tax Withheld

To EMPLOYEE: This is your copy. Do not file with Collector. If you use Employee's Optional Income Tax Return on back of the original Form W-8 on your return, you should make a record of your return below:

1. Write total of wages shown on this and all your other 1946 Withholding Statements \$.....

2. Write total of all other wages, dividends, and interest \$.....

3. Add lines 1 and 2. Write total here \$.....

4c. If line 3 includes income of both husband and wife, show husband's income \$..... wife's income \$.....

List of dependents claimed:

(Name) (Relationship) \$.....

(Name) (Relationship) \$.....

(Name) (Relationship) \$.....

(Name) (Relationship) \$.....

Unions from and to dates are shown below earnings are for calendar year 1946

From To

Fig. 7—Employee's Earnings Record— $3\frac{1}{2}$  by 8 inches

Distribution cards are punched for each line on the bottom half of the time-report, with the gang number, week number, account number and the amount of the charge for regulartime, overtime and transportation punched on each card. After the cards have been balanced with the time report controls, they are sorted into account number order and distribution summaries are run.

The payroll summary cards are retained each week and at the end of the quarter are summarized and a quarterly summary card punched. These quarterly summary cards are sorted-in with a set of social security master name cards for running the quarterly social security and unemployment insurance reports.

#### Retain Summary Cards

The quarterly summary cards are retained until the end of the year when they are sorted with the name and address cards and a special form of W-2 "Withholding Statement" is run from them, Figure 7. This statement is prepared with five copies as follows:

1. Employee (Bureau of Internal Revenue)
2. Employee (retained by employee)
3. Collector of Internal Revenue
4. Company file
5. State Income Tax

The fourth copy is filed in an individual employee file with similar copies for preceding years and constitutes the company's record of each employee's quarterly earnings.

Thus, in making sure that John Doe gets paid on time, the company completes all its auxiliary and related payroll and labor distribution records economically and within statutory time limits.

## A. G. A.-E. I. Accounting Conference Speakers



Merle C. Hale



Murray Shields

THREE principal speakers have been announced for the general sessions of the tenth national conference of Electric and Gas Utility Accountants at the Hotel Statler in Buffalo, April 7-9.

James V. Toner, president of Boston Edison Co., is scheduled to deliver an address on "The Accountant's Place in Management—A Challenge to Each of Us." Mr. Toner is a recognized authority on accounting and finance and has gained a national reputation as the author and co-author of several books on that subject.

Murray Shields, vice-president, Bank of the Manhattan Co., New York, and one of the country's foremost financial and economic experts, will speak on "America's Economic Outlook." Mr. Shields is the author of recent authoritative books on current economic problems and a contributor to national publications.

Merle C. Hale, director of salaried personnel activities, General Motors Corp., will

discuss "Employee Relations—Office Workers." Mr. Hale has an extensive background in public and industrial relations.

## A. S. M. E. Boiler Code Committee Hearings

THE Boiler Code Committee of The American Society of Mechanical Engineers will hold two public hearings in the Southwest on the proposed revision of Section VIII of the ASME Boiler Construction Code (Unfired Pressure Vessel Code). The first of these hearings will be held in Houston, Texas, at the Rice Hotel, May 1 at 8 P.M. and May 2 at 9:30 A.M. The second hearing will be held in Los Angeles, at the Biltmore Hotel, May 7 at 9:30 A.M.

The purpose of the hearings is to give all those interested in the code, including pressure vessel manufacturers, users, and state enforcement authorities, an opportunity to express verbally their comments on the proposed revision.

The public hearing in Houston will be under the sponsorship of the ASME South Texas Section, and the one in Los Angeles under the sponsorship of the Southern California Section. Members of the Boiler Code Committee and its subcommittees are planning to travel in a group to attend these hearings.

The Boiler Code Committee will also hold its May meeting at the Biltmore Hotel in Los Angeles on Friday, May 9.

For those interested in reviewing the proposed revision, copies are obtainable from the ASME at 29 West 39 Street, New York 18, N. Y., at \$1 per copy. All those interested are invited to submit their comments in writing to the Secretary of the Boiler Code Committee, whether or not they are able to attend one of these hearings.

The National Board of Boiler and Pressure Vessel Inspectors is also holding its General Meeting, May 5-8, at the Biltmore Hotel, Los Angeles.

## New Freedom Gas Certification Program

A HARD-HITTING New Freedom Gas Kitchen Certification Program designed to enhance the prestige of the nation's home builders and act as a lever for the introduction into new homes of additional or better gas appliances, was announced at the American Gas Association's Midwest Gas Sales Conference in Chicago, March 17-18.

In making the preliminary announcement, H. Vinton Potter, director of the A. G. A. New Freedom Gas Kitchen Bureau, stressed that the certification program will be aimed at filling the exacting demands of an already developing buyers' market in new homes. The customer, builder, architect, banker and dealer all will profit, he said.

The A. G. A. program will set up minimum standards for New Freedom Gas Kitchens and make each gas company sales manager or designated kitchen planning consultant custodian of the program for his own local territory and he may amplify the minimum standards according to particular needs.

Conversations with builders across the nation as well as with officials of builders'

magazines and others with a definite stake in home building plans, Mr. Potter stated, show that customers will demand complete homes and that builders will be challenged to merchandise their products in more glamorous ways. Customers will demand in their homes nationally advertised products, the use of which smart builders realize will enhance their own prestige by acting as an endorsement of the quality of the entire house.

What better endorsement could a builder get, he remarked, than a certificate which shows that the kitchen, the heart of the modern home, conforms to the New Freedom Gas Kitchen standards, nationally advertised, reaching 29 million families in 1947 alone.

On or about May first a 16-page brochure will be published by the A. G. A. New Freedom Gas Kitchen Bureau containing complete details of the certification program.

Response to Mr. Potter's Gas Sales Conference speech was enthusiastic and the large number of on the spot requests for information indicate that the certification campaign will attract wide attention.

## 'Burgers

● According to lexicographer H. L. Mencken, 37 varieties of hamburger have been served up to Americans since the 'burger was introduced to the U. S. from Hamburg, Germany, in 1884. Among them are such delicacies as goonburger, glutenburger, huskiburger, pickleburger, dogburger, fishburger, oomphburger.

A reader, recently with the U. S. Army, adds three more: The turtleburger, served in Key West, Fla.; the deerburger, served at a roadside stand in Bemidji, Minn.; and the wartime wallyburger, made from Australian wallabies (little kangaroos) and served in a New Guinea Army camp when provisions got low.

—This Week

# Residential Gas Section

WALLACE M. CHAMBERLAIN, Chairman

C. S. STACKPOLE, Vice-Chairman

F. W. WILLIAMS, Secretary

## Midwest Sales Meeting Outstanding

**M**ORE than 600 members of the gas industry attended the first postwar regional gas sales conference of the Midwest Sales Council, held under the sponsorship of the Residential Gas Section of the American Gas Association at the Edgewater Beach Hotel, Chicago, March 17-18.

A packed auditorium at the morning and afternoon sessions testified to the outstanding interest and information value of the program arranged by Co-ordinator H. D. Valentine, The Peoples Gas Light & Coke Co., Chicago, and his committee.

J. C. Sackman, Northern Indiana Public Service Co., chairman of the Council, presided at the Monday meeting. In welcoming the group, he pointed out several factors upon which gas sales people can cash in during coming months.

Bennett S. Chapple, Jr., assistant sales vice-president, United States Steel Corp., and keynote speaker of the conference, told of the opportunity for salesmen to contribute to the nation's well-being. Production is not the key to all of the country's problems, he said. Unless output is sold, bloated inventories and sales-price reductions can darken the economic picture. He declared it more important for a manufacturer to own a market than a mill.

Commenting on estimated steel production, Mr. Chapple said steel ingot capacity had been increased to approximately 92 million tons, a gain of about 15 percent over prewar capacity. Regarding steel sheet and strip production, of specific interest to appliance and

equipment manufacturers, he pointed out that despite production capacity increases during the war, the industry produced only 14 million tons in 1946, due to strikes and work stoppages in steel mills and allied producers' plants. Production capacity of 19 million tons is planned when all new facilities come into operation late this year or early next year, barring further labor troubles.

Distribution of this output still poses many problems, the speaker said. Even with the lifting of CPA restrictions, the National Housing Authority would demand priorities for veterans' housing; the canning industry would need sheet and tin plate for canning perishable foods for destitute countries, freight car shortages demand channeling steel into that production field. All of these, he indicated, would be competitors with the gas industry in obtaining deliveries of steel.

### Three Fundamentals

F. X. Mettenet, vice-president, The Peoples Gas Light & Coke Co., spoke on dealer, manufacturer and gas utility company relations. Any sales plan should contain three fundamentals, he said: raising the quality of the product; controlling that quality; and insuring that the quality as well as the quantity is increased each year. The utility company should take the lead for the manufacturer and the dealer in any market and should know its market thoroughly.

Harold E. Jalass, general sales manager, Cribben & Sexton Co., destroyed the illusion

of the Big Bad Wolf of competition from competitive fuels. Using printed competitor's statements as a basis of comparison, Mr. Jalass, proved, in a dramatic and entertaining sales demonstration, that gas can perform all the operations of cooking better and cheaper, while leaving kitchens cleaner and cooler.

Dr. Kenneth McFarland, Superintendent of Schools, Topeka, Kansas, opened the afternoon session on Monday, with a talk on human relations in business. From a rich background of contacts with every type of business in the nation, he drew graphic illustrations of the necessity for understanding human beings and the individual's importance in all business relations.

H. Carl Wolf, managing director American Gas Association, outlined the many activities of the Association which are specifically designed to aid the members of the council in creating more sales of gas and gas appliances. Predicting a great advancement throughout the entire industry, Mr. Wolf told of the serious responsibility that rests on the shoulders of council members and other sales representatives of the gas industry.

He was followed on the program by Wallace M. Chamberlain, sales manager, Michigan Consolidated Gas Co., and chairman, A. G. A. Residential Gas Section. Mr. Chamberlain contributed a brief but illuminating report on the activities of the Residential Gas Section and the part it has played in aiding sales of gas and gas appliances.

Bernard T. Franck, vice-president, Milwaukee Gas Light Co., spoke on the subject of



Conference Chairman J. C. Sackman



F. X. Mettenet



B. H. Wittmann

decentralization. From his own experiences in prevention of blight areas in Milwaukee through the too-rapid expansion of fringe and rural building developments, Mr. Franck pointed out ways in which utility companies can help improve housing conditions in their own cities, these aids would be civic contributions, he said, and also would profit the utility company through reducing distribution and transmission costs.

An estimated 800 conferees and guests attended the conference dinner and entertainment at the Edgewater Beach Hotel on Monday evening. The program arranged by Mr. Valentine and his committee helped those present to fully enjoy the spirit of St. Patrick's Day.

B. H. Wittmann, domestic sales manager, The Peoples Gas Light & Coke Co., and chairman-elect of the Council for 1948, served as chairman for the second day of the Conference. W. L. Hayes, sales manager, Montana-Dakota Utilities Co., Minneapolis, is the vice-chairman-elect.

The opening speaker, E. Carl Sorby, vice-president, George D. Roper Corp., thoroughly sold his audience on "CP" Range pro-

motion, of which Mr. Sorby is committee chairman. In his usual dramatic presentation, he told the story of modern cooking on automatic "CP" gas ranges, leaving no doubt in the minds of his audience as to the superiority of gas ranges.

H. Vinton Potter, A. G. A. New Freedom Gas Kitchen Director, carried the gas appliance story a step further through his presentation of automatic gas appliances in glamorous New Freedom Gas kitchens settings. Mr. Potter described the new A. G. A. certification program soon to be launched whereby builders, architects and home builders can gain prestige through sales of a modern kitchen certified as to efficiency, beauty and ultra-modernity. Helen Kirtland, home service director, Ohio Fuel Gas Co., posted the Conference on the newest developments in home service work by describing types of visits and objectives attained by home service girls in the industry.

William C. Gordon, market and research analyst, Curtis Publishing Co., delivered an illuminating talk on sales prospects of the gas industry. Stressing the trend from a sellers to a buyers market, as indicated by con-

sumers' desires for labelled and nationally advertised merchandise, Mr. Gordon predicted that highly competitive selling was just around the corner. He advised manufacturers and utility companies to stop worrying about regulatory and labor problems and to devote more attention to the customer, who in the final analysis, makes or breaks a company. Market research, advertising and promotion and sales training are the three major fields in which future sales of the industry will be developed.

The theme—reaching tomorrow's customers today—was further exploited by Mary Mark, director, Bureau of Household Arts, Chicago Public Schools and by Lloyd C. Ginn, sales promotion manager, American Stove Company. These experts brought the gas industry valuable information on ways and means of bringing the true story of the modernity of gas to young people. Mr. Ginn, as chairman of the Domestic Range Division, Gas Appliance Manufacturers Association, told the Sales Council what is being done in the promotion field to reach the home economics departments of high schools, colleges and universities.

Rebecca Sullivan, home service director, The Gas Service Co., Topeka, gave an effective demonstration of the Fourth Zone of cooking as exemplified in the low-pressure steam cooker developed by the Kansas City Gas Co. and the Vendo Co. and currently being included in domestic gas ranges by several of the leading manufacturers.

Monday's conference session was brought to a close by a timely educational production staged by R. J. Caniff, advertising and sales promotion director, Servel, Inc. and his cast of seasoned troupers. Servel first presented its Time and Motion Study designed to aid in planning efficient kitchens. Following this the Servel troupe offered an amusing skit, "Mrs. Wilson's Kitchen," illustrating five steps necessary in planning and selling a modern kitchen.

In the same vein, the program on Tuesday was closed by Frank McFerran, general sales manager, Ruud Manufacturing, and Malcolm R. Rodger, utility sales manager for Bendix Home Appliances, Inc. Their duet: "This is the way we wash our clothes," was the overture to an excellent presentation of gas automatic hot water requirements and their importance in meeting demands for the modern automatic home laundry.

## A. G. A. at Home Builders' Exposition



*Clifford E. Hall and Florence Woodward (left) and Mary Huck and Norval Jennings with the popular A. G. A. New Freedom Gas Kitchen exhibit*

**A**PPROXIMATELY 20,000 New Freedom Gas Kitchen layout sheets and an equal number of architects' plans were given out at the request of visitors lined up to view the American Gas Association exhibit at the National Association of Home Builders' Exposition in the Stevens Hotel, Chicago, February 23-27.

Basic theme of the A. G. A. display was the certification program of the New Freedom Gas Kitchen Bureau. A seven-page mechanical book pointed out the major sections of this program and four color-film reproductions and eight miniature models showed different types of New Freedom Gas Kitchens.

A. G. A. representatives Clifford E. Hall and Norval Jennings were in attendance to

answer thousands of questions on kitchen planning and gas appliances for the modern home. Following a precedent which A. G. A. initiated at the 1946 Exposition, the gas industry display was staffed with girl attendants. Visitors were impressed by the appearance and technical knowledge of Florence Woodward, Rochester Gas and Electric Corp., and Mary Huck, The Ohio Fuel Gas Company.

Next to the A. G. A. exhibit was the Servel display showing the only complete all-gas kitchen on the floor and including the firm's new gas water heater, gas refrigerator and gas-fired all-year air conditioning unit.

In the heating line gas had more exhibits than any other fuel.

## Gas Sales Up in January

**T**OTAL gas utility sales to ultimate consumers in January were 3,069,994,000 therms, an increase of 10.1 percent over January, 1946. The American Gas Association's index of total gas utility sales on January 31, 1947 stood at 215.0 percent of the 1935-1939 average. For the 12 months ending January 31, 1947, total gas utility sales were 26,458,759,000 therms, an increase of 1.9 percent over a year earlier.

Natural gas sales in January rose 9.6 percent, manufactured gas sales rose 11.7 percent, and mixed gas sales rose 16.5 percent over January 1946.



# Industrial & Commercial Gas Section

KARL EMMERLING, Chairman

LEON OURUSOFF, Vice-Chairman

MAHLON A. COMBS, Secretary

## Fast-Moving Sales Conference



Head table at luncheon during A. G. A. Sales Conference on Industrial and Commercial Gas. Left to right: William Webster, New England Power Association, Boston; Frederic O. Hess, Selas Corp. of America, Philadelphia; E. H. Eacker, Boston Consolidated Gas Company; Dr. George Harrison, Massachusetts Institute of Technology, Cambridge, Mass.; Karl Emmerling, Cleveland; R. H. Hargrove, President, American Gas Association; Frank H. Adams, Surface Combustion Corp., Toledo; L. E. Knowlton, New England Gas Association, Fredrick T. Potter, Whitin Machine Works, Whitinsville, Mass., and Mahlon A. Combs, secretary, A. G. A. Industrial and Commercial Section

THE rapt attention of 200 delegates from 18 states, Canada and the District of Columbia testified to the interest value of the program at the 1947 A. G. A. Sales Conference on Industrial and Commercial Gas, held at the Copley-Plaza Hotel, Boston, March 17-19.

The first day, devoted exclusively to commercial gas subjects, opened with William E. Broeg, nationally known food consultant of Boston and San Francisco, discussing "How Various Foods Are Best Cooked." Each paper presented was a highlight in itself and all reflected the integrated program prepared by the committee under the chairmanship of Harry A. Sutton, Public Service Electric & Gas Co., Newark. Complementary talks were presented by Colonel Paul P. Logan, director of food research, National Restaurant Association, Chicago, who spoke on "Trends in Food Supply." Milford W. Wall, S. Blickman, Inc., Boston, and Clarence E. Hebert, Lynn Gas & Electric Co., spoke on "Commercial Kitchen Planning," and "Selecting Commercial Cooking Equipment" respectively.

During the afternoon session Thomas J. Gallagher, manager, Commercial Sales, The Peoples Gas Light and Coke Co., Chicago, told the assembled delegates where gas can be sold on "Main Street," leaving some thought provoking ideas with his audience. K. Camille Den Dooven, H. A. Johnson Co., followed him with an inspiring talk on retail bakeries and gas utilization in that field.

Without pulling any punches, H. A. Nordquist, Hobart Manufacturing Co., Troy, Ohio, spoke on Restaurant Sanitation, stating that it is up to the gas industry to provide the ways and means for hot water for the sterilization that is required by most local sanitary codes.

\* Abridged version of talk appears in this issue.

Commercial gas research was pictured in a forceful manner by Roy E. Wright, of Negea Service Corp., Cambridge, who told the assembled delegates that research must be started immediately if the industry hopes to benefit by a long-range program. His subject title was "It May Be Later Than You Think."

John J. Bourke, Director, A. G. A. Commercial Gas Cooking Promotion, told the meeting on Tuesday about the aims and purposes of that program. On the industrial side, Frank H. Adams, president, Surface Combustion Corp., painted an optimistic picture of benefits to be gained by industry-wide cooperation.\*

In order to show the delegates what a gas customer expects from his local gas company; "What Gas Means to the Industrial User" was presented by Frederick T. Potter, Whitin Machine Works, Whitinsville, Mass. Ernest Henderson, president, Sheraton Hotels, Boston, presented his views on the commercial side of the picture.

The formal luncheon on Tuesday was attended by so many delegates that seating capacity was taxed to the utmost. After a short talk by R. H. Hargrove, A. G. A. president, the guests heard what they deemed was one of the most interesting conference talks ever presented. Dr. George R. Harrison, dean of Science, M.I.T., Cambridge, spoke on "Industry and the Atom," giving a down-to-earth talk on a highly technical subject. He allayed any fears that atomic energy would supplant existing forms of energy. His emphasis was that any new applications of atomic energy would supplement present uses.\*

### Inspirational Talk

During the afternoon session Frank W. Lovejoy, sales executive, Socony-Vacuum Oil Co., Inc., New York, gave a two-fisted inspirational talk on merchandising, advising his audience to keep up sales and promotional activities in spite of gas and appliance shortages. Research was covered by Leroy F. Marek, Arthur D. Little, Inc., Cambridge. Captain E. S. Pettyjohn, director, Institute of Gas Technology, Chicago, spoke on the activities of his organization and "Production and Distribution Trends." The day's sessions closed with an enlightening address, illustrated with charts, by E. H. Eacker, vice-president, Boston Consolidated Gas Co., on "Gas vs. Competitive Fuels Under Changed Economic Conditions."

On Wednesday, March 19, the sessions were devoted to industrial gas subjects. Here again the diversity of subjects gave attending gas men a well-integrated program and a wealth of information to take back to their respective communities.

"Selling High Temperature Convection Ovens," presented by Hale A. Clark, Michigan Consolidated Gas Co., Detroit, started off the session. Next Charles C. Eccles, chair-

### NOTE ON YOUR CALENDAR

Industrial Gas School—week of May 5—Hotel Seneca, Columbus, Ohio

Commercial Gas School—week of May 12—Washington Gas Light Co., Auditorium and Lewis Hotel School, Washington, D. C.

National Metal Congress & Exposition, October 20-24—Amphitheater—Chicago

National Hotel Exposition, November 10-14—Grand Central Palace, New York



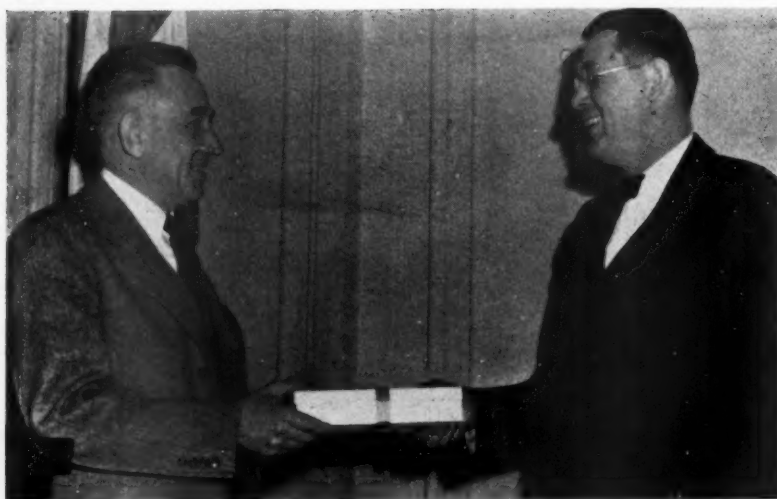
E. V. K. Schutt



E. H. Eacker



Roy E. Wright



Top, Karl Emmerling (left) chairman, A. G. A. Industrial and Commercial Gas Section, presents traditional gavel to immediate past-chairman Harry A. Sutton. Bottom: H. E. G. Watson (right) Toronto, Canada, receiving Hall of Flame certificate

man, A. G. A. Committee on Heat Treating and Finishing with Gas, read an informative paper prepared by R. B. Grossman, Southern California Gas Co., Los Angeles, on "Drying Ovens, Low Temperature Radiant Panels." Two gentlemen outside the gas industry who held the attention of the audience with talks on, "Important Factors in Oven Design and Use," and "Heat Applications in Precision Casting," were C. A. Litzler, president, Industrial Ovens, Inc., Cleveland, and Paul L. Butler, J. R. Wood Products Corp., Brooklyn.

Closing the conference were four papers on widely different subjects each of which offered something of utmost value to the delegates. K. I. Robinson, Public Service Electric and Gas Co., Newark, stated "Our Position in Wholesale Baking." Then Orville E. Cullen, Surface Combustion Corp., Toledo, Ohio, told "What to Look for in the Metal Industries." "New Fields for Prepared Atmospheres" was discussed by W. A. Darrah, Intercontinental Engineers, Inc., Chicago. The conference closed with an informative paper on "How to Sell Gas in Textile Processing" by E. V. K. Schutt, Central Hudson Gas & Electric Corp., Newburgh, New York.

A check list will be sent to the A. G. A. Section membership so that they may indicate their desire for any of the papers presented at the 1947 conference.

#### Industrial and Commercial Hall of Flame

Following a custom established last year, certificates were awarded members and former members of the gas industry who have made outstanding contributions to the welfare and progress of the industry through services performed in the A. G. A. Industrial and Commercial Gas Section.

Last year certificates were presented to all those who had qualified since 1935. This year it was decided to admit to membership those who had performed similar services from the time of A. G. A. organization up to 1935 as well as those who had qualified during the past year.

Certificates were awarded as follows:  
Past chairmen of Industrial Fuel Committee

of the Commercial Section (now A. G. A. Residential Gas Section) Thomson King, Commercial Engineer, Consolidated Gas Electric Light & Power Co. of Baltimore, and E. J. Stephany, formerly, Equitable Gas Co., Pittsburgh.

Men who acquired all their points before 1935—A. B. Greenleaf, formerly, The Peoples Gas Light & Coke Co., Chicago; F. X. Mettenet, vice-president, The Peoples Gas Light & Coke Co., Chicago; Clarence E. Muehlberg, formerly, Consolidated Edison Co. of N. Y., Inc.; Robert E. Ramsay, president, New Haven Gas Light Co., New Haven, Conn.; Hubert F. Rehfeldt, sales development engineer, and J. F. Weeden (Deceased) formerly, The Peoples Gas Light & Coke Co., Chicago.

Men who had 25 points or more before 1935 and have added some since—Lt. Col. Arthur M. Apmann, formerly, Derby Gas & Electric Co., Derby, Conn.; E. G. deCoriolis, director of research, Surface Combustion Corp., Toledo, Ohio; C. H. French (Deceased) formerly, Standard Gas Equipment Corp., Baltimore; Hall M. Henry, director gas operations, Negea Service Corp., Cambridge; William M. Hepburn, vice-president, Surface Combustion Corp., Toledo, Ohio; Nils T. Sellman, vice-president, Westchester Lighting Co., Mt. Vernon, N. Y.; H. E. G. Watson, Superintendent Industrial Sales Dept., Consumers Gas Co. of Toronto, Toronto, Canada, and W. Wirt Young, partner, H. Wirt Young & Associates, Waterbury, Conn.

Men who acquired some points after 1935 and with those they already had, now qualify—Frank H. Adams, president, Surface Combustion Corp., Toledo, Ohio; Donald A. Campbell, Industrial Division, Bryant Heater Co., Cleveland; Walter D. Crouch, manager, Commercial and Industrial Division, Robert-

shaw Thermostat Company, Youngwood, Pa.; Lester A. Dubberke, supervisor, Hotel and Restaurant Division, Milwaukee Gas Light Co.; William H. Frick, manager, Heavy Duty Equipment Dept., American Stove Co., Cleveland; Ralph D. Hawkins, formerly, The Bridgeport Gas Light Co.; Louis H. Hungate, Jr., formerly, United Gas Corp., Houston, Texas; George S. Jones, Jr., vice-president in charge of sales, Servel, Inc., Evansville, Ind.; A. V. Leudemann, general sales manager, Mears-Kane-Ofeldt, Inc., New York, and Ivar Lundgaard (Deceased) formerly, Rochester Gas & Electric Corp., Rochester, N. Y. Oliver Lloyd Maddux (Deceased) formerly, representative, Eclipse Fuel Engineering Corp., New York; John A. Malone, formerly, Consolidated Edison Co. of N. Y. Inc.; James C. Patterson, director of Heating Sales, Carrier Corp., Syracuse; C. B. Phillips, general sales manager, Surface Combustion Corp., Toledo, Ohio; E. R. Rothert, vice-president, The Cincinnati Gas & Electric Co.; Lawrence E. Wagner, industrial engineer, Providence Gas Co.; W. Stockton Walker, manager, Sales Technical Bureau, Consolidated Edison Co. of New York; Harvey C. Weller, engineer, Surface Combustion Corp., Toledo, Ohio, and Roy P. Wilson, formerly, The Philadelphia Gas Works Co.

Men who have now earned enough points since 1935 to qualify—Don D. Beach, industrial sales manager, Atlanta Gas Light Co., Atlanta, Ga.; Charles C. Eeles, industrial engineer, The Ohio Fuel Gas Company, Toledo, and W. M. Jacobs, manager of general sales, Southern California Gas Co., Los Angeles.

Certificate for many years' contributions to A. G. A. Industrial and Commercial Section activities—C. George Segeler, Utilization Engineer, American Gas Association.

## New Pint-Sized Gas Meter

THE Pittsburgh Equitable Meter Division of Rockwell Manufacturing Co. recently introduced a new gas meter designed to measure manufactured, natural and LP gas. Smaller and lighter weight than conventional designs, the meter is only 8 inches by 7 7/16 inches by 10 5/16 inches high. The net weight is but 8 1/2 pounds.

The outer casing, consisting of two streamlined aluminum-alloy pressure castings joined with a single gasket will not rust or corrode and has a high fracture resistance for safety.

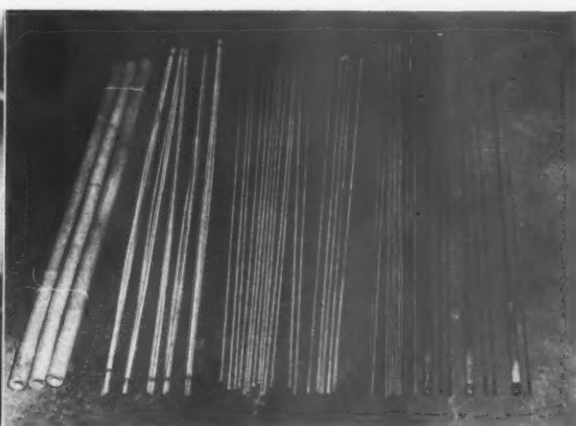
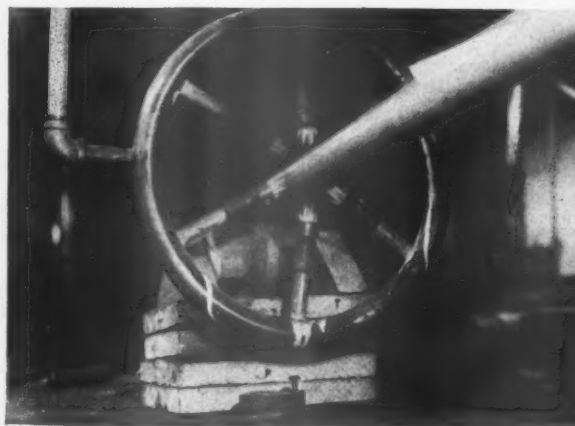
The double diaphragm displacement measuring unit has a maximum capacity of 150 cfh at 1/2 inch absorption of .06 sp. gr. natural or manufactured gas. In measuring LP gas the capacity rating is 90 cfh at 1/2 inch pressure absorption of 1.5 sp. gr. gas ample for practically all domestic services.

## "Flame-Weeder"

PROPANE gas is promoted by the Phillips Petroleum Co., Bartlesville, Oklahoma, as the ideal fuel for the "flame-weeder"—domesticated model of the wartime "flame-thrower."

The new machine is designed to kill off weeds with searing blasts from jets of fire, tractor-drawn, while leaving the plant rows themselves undamaged. Recent tests in the South show that the machine can flame-weed 20 acres of cotton a day at a cost of 47 cents an acre, compared with six dollars an acre formerly, the company reports.

## Gas Flame Proves Vital Assistant to Master Craftsman



Industrial gas has some unique yet very practical uses. Paul Young of Detroit makes the finest grade split bamboo fly rods, casting rods and rods for all types of fishing in his own shop, in connection with a general sporting goods business. Starting with bamboo poles imported from China, he has devised a means of curing and also of producing a color finish very much desired by expert fishermen. A ring burner using premixed gas is used to impinge jets of flame on the bamboo pole as it slowly moves through the ring. The intense heat "singes" the pole and produces the desired color effect when the bamboo is finally split and the sections of the pole assembled. The three poles pictured above have just arrived from China. Next to them are: mitered sets of six sections, mitered sections glued and wrapped, sets with wrappings removed, sanded rod sections, and finished rods of two and three sections, each made by Mr. Young.

# Technical Section

C. S. GOLDSMITH, Chairman

A. C. CHERRY, Vice-Chairman

A. GORDON KING, Secretary

## Protecting Pipe in Open Systems<sup>1</sup>

By M. D. APPLEMAN<sup>2</sup>

Assistant Chief of Soil Biology  
University of Illinois

A REVIEW of the literature in the field of soil micro-biology reveals the studies that have been made in advancing knowledge of the characteristics of many soil micro-organisms. The application of this knowledge in solving problems of soil development and soil productivity has been widespread. It appears to the author that little recognition has been given to the relationship between soil micro-organisms responsible for anaerobic corrosion of metals and chemical and physical conditions of soils. The purpose of this paper is to indicate how anaerobic corrosion may be eliminated through the application of basic principles familiar to soil bacteriologists, soil chemists and soil physicists, and to indicate promising directions for future research.

Many excellent research investigations have been made of the physiology of the sulfate-reducing anaerobes (t.s. *Sporovibrio desulfuricans*), organisms which are responsible for most of the biological corrosion of iron and steel pipes under conditions of reduced oxygen tension. Beckwith (1941), Bunker (1937, 1938, 1939, 1942, 1944), Hadley (1939, 1940a+b, 1943, 1944) Starkey (1937, 1938, 1945), and Starkey and Wight (1943, 1945) have made valuable contributions to the knowledge in this field. These authors, as well as Knudson (1940), Romanoff (1943, 1945), and Thomas (1942) studied also the factors involved in the control of corrosion caused by this group of micro-organisms.

### Types of Research in Progress

The methods which have been employed in attempts to control corrosion resulting from the activity of the anaerobic sulfate-reducing bacteria in open systems are based upon one or more of the following practices:

1. Cathodic protection.
2. Promotion of aerobiosis.
3. Protective coating of the pipes.
4. Use of alloys, particularly copper alloys.

All of these methods of control, with the exception of the second, are concerned with the treatment of the pipe itself. Very little

<sup>1</sup>Contribution from the Department of Agronomy, University of Illinois Agricultural Experiment Station. Published with the approval of the Director of the Illinois Agricultural Experiment Station.

<sup>2</sup>The author wishes to express his appreciation for the helpful suggestions of Dr. Max Suter, engineer, Illinois State Water Survey.

has been done about the possibility of treating the soil with insoluble disinfectants or other agents to eliminate the action of sulfate-reducing bacteria.

Cathodic Protection:—Beckwith's experiments (1941) indicate that cathodic protec-

### Distribution Motor Vehicle Conference

Final preparations for the Distribution and Motor Vehicle Conference, sponsored by the Technical Section of the American Gas Association, have been completed following a few late changes and rearrangements of the advance program. The conference is scheduled for the Hotel Cleveland, Cleveland, Ohio, April 14-16. Plans call for general sessions with a wide variety of guest speakers, conferences on various topics, roundtable luncheon meetings and an inspection of typical equipment at the A. G. A. Testing Laboratories. Association officers and numerous industry leaders will highlight the program.

tion is of little value under laboratory conditions, although Hadley (1940a) who conducted field experiments using this procedure was optimistic about its success. The latter (1943) demonstrated that *Sporovibrio desulfuricans* is responsible for a reduction in the film resistance of the metal electrode-solution interface as well as for cathodic-hydrogen depolarization.

Promotion of Aerobiosis:—Aerobic methods of controlling sulfate-reducing anaerobes were discussed by Bunker (1942) who advocated surrounding pipes laid in "heavy clay" with nine to 12 inches of gravel or sand which in his opinion contributes to aerobiosis. Hogg (1944) indicated that sand around the pipes might allow water-carrying sulfates to surround the pipes continuously, thus contributing to the condition that should be avoided—namely, complete anaerobiosis. He called attention to the fact that the increase

in cost of bedding a nine-inch pipe at normal depth in sand would be about 20 percent over that where sand was not used. Hogg wondered whether asbestos-cement pipes might be substituted for cast iron, but here again there was a possibility that the cement might be subject to attack and decomposition. Bunker (1944) claimed that sand or gravel bedding had been utilized quite successfully.

It is unfortunate that the calcium carbonate content and neutralizing value of sand and gravel used for bedding pipes have not been recorded in most of these experiments. Many sands contain sufficient limestone to neutralize acids formed by soil bacteria; others are chiefly silica, having no neutralizing value. The effect of limestone on the activity of *Sporovibrio desulfuricans* is not understood. Theoretically, it might stimulate corrosion in acid soils by raising the pH to one more favorable for this group of micro-organisms. However, even this non-acid corrosion seems to occur more rapidly in sands which do not contain calcium carbonate; hence, some other factor than pH seems to be involved. A study should be made to determine whether the sulfates are being precipitated in the soil adjacent to the treated zone but not in contact with the pipeline.

Protective Coating of the Pipes:—Hadley (1940a) used a petroleum-asphalt coating on pipe encased in a box constructed of durable wood. The pipe was supported and centered on vitrified porcelain cleats having a maximum water absorption of less than 0.1 percent. After nine years in a locality where sulfate-reducing bacteria were ordinarily active, corrosion of pipe treated in this manner was reduced to a negligible amount.

Starkey and Wight (1945) tested certain materials that might be utilized for protective coating for pipe lines. Their results demonstrate that cellulosic compounds, particularly cellulose acetate, are relatively susceptible to attack by soil micro-organisms. Fabric and asbestos treated with them lost approximately 50 percent of their tensile strength when subjected to either aerobic or anaerobic incubation in soil for 12 months. These authors made no tests to determine the durability of either creosote or bitumen. Pain (1944) attempted to use bitumen sheathing for pipe-lines and found the increase in cost over uncoated pipe to be approximately 20 percent.

Lessing (1944) found that bacteria other than the sulfate-reducers might be important in the disintegration of metals. In particular,



he mentioned a case where lead-sheathed cable was attacked by micro-organisms which decomposed the cellulose wrapping and created a series of craters throughout the length of the cable which were filled with lead carbonate, probably formed by the action of carbon dioxide excreted by the cellulose decomposers. Hadley (1940a) demonstrated that sulfate-reducing bacteria supplied with cellulose (filter paper) attacked zinc, carbon steel, lead and, to some extent, stainless steel. Copper subjected to the same conditions was practically unaffected.

Use of Alloys:—Bunker (1944) states that at Teddington, England, the use of steel pipe containing copper was ineffective in preventing corrosion. The use of pipe covered with wrappings impregnated with copper naphthenate is now being investigated. He questions the effectiveness of concrete or slurry coverings.

### Suggested Materials and Methods of Research

In view of the failure of other methods, two lines of investigation are proposed:

1. The use of chemical agents toxic to *Sporovibrio desulfuricans* for treatment of the pipe, or impregnation of the soil adjacent to pipe lines.
2. The use of chemical agents effective in soil stabilization that prevent water penetration to the pipes.

Chemical Agents Toxic to Bacteria:—The work of Bunker on wrappings impregnated with copper naphthenate is representative of the type work that should be done with other compounds toxic to soil bacteria. Wrappings, however, are only a partial solution to the problem. Plastics, paints and waxes impregnated with bactericidal agents should be studied as protective materials for metal. Waxes of such consistency that they will adhere to pipe may be applied directly to the metal or to treated wrappings around pipe. Since the waxes provide toxicity to the organisms and resistance to moisture they should prove more effective than wrappings alone.

In our laboratories paraffin impregnated with copper sulfate or with potassium dichromate has been used as a protective coating for cotton plugs in culture tubes. In one experiment more than 200 tubes were inoculated with bacteria and restoppered. The stoppers dipped in untreated paraffin allowed five percent contamination of the cultures, whereas stoppers dipped in paraffin treated with either copper sulfate or potassium dichromate allowed no contamination.

Cultures of sulfate-reducing bacteria growing in flasks in the laboratory were killed by immersing stoppers treated with the paraffin-copper sulfate mixture. Although the chemical is imbedded in the wax in such a way that only the amount at the surface is available, a concentration of copper ions toxic to the cells accumulates. The results of Hadley (1940a), mentioned previously, indicate that mixed cultures of *Sporovibrio desulfuricans* did not attack metallic copper. It is possible that minute amounts of organic acids pro-

## Joint Production and Chemical Conference

A timely, broad-gauged program has been approved for the American Gas Association's Joint Production and Chemical Committee Conference at the Hotel New Yorker, New York, June 2-4.

Subjects tentatively placed on the agenda include, among others, Production of Oxygen, Likely Processes for Low Cost Oxygen, Experiences in Making High B.t.u. with Converted Water Gas Machine, Future Possibilities of Manufactured Gas Processes, Location of Internal Defects of Plant Equipment, Interchangeability of Gases, Carbon Deposition and Its Removal, Use of Silican Carbide in Water Gas Sets, Receiving, Handling and Unloading of LP Gas, and Safety.

Samuel Green, The Brooklyn Union Gas Co., is Gas Production Committee chairman, and W. R. Fraser, Michigan Consolidated Gas Co., Detroit, is Chemical Committee chairman.

duced by the organisms liberate sufficient copper salts under the same conditions to inactivate this group of organisms. The reduction in sulfate content of the water in these particular results shows that this probably did not occur under the conditions of this experiment.

Even though waxes, plastics or paints impregnated with certain chemicals were proved to be toxic to the sulfate reducers under laboratory conditions, it would not necessarily mean that the compounds could be used under field conditions. In soils where there is a constant movement of moisture, and consequently a movement of dissolved salts and bacterial population, there might be reason to believe that the toxic soluble compounds would be removed. This condition might be sufficient to nullify this type of attack upon the anaerobic bacteria of the soil. There are now available many relatively insoluble organic and inorganic compounds toxic to bacteria which might be successfully used to poison the sulfate-reducing organisms in the vicinity of pipes. These compounds may be mixed with the soil around the pipe or applied in adhesive materials. Compounds chosen must not attack iron or steel.

Chemical Agents for Soil Stabilization:—The idea of soil stabilization and waterproofing for the purpose of reducing corrosion may seem revolutionary to investigators who have thought only in terms of promoting aerobic conditions in the region of pipe lines. If the soil were compacted around a pipeline so that no water penetrated it, corrosion of metal by *Sporovibrio desulfuricans* would be prevented. This procedure would correspond to coating pipes with bitumen, with the exception that the treated soil itself would be the insulating material. The success of this method is dependent upon maintenance of a

perfect seal. If water-carrying sulfates could penetrate between the pipe and the compacted soil, anaerobic conditions conducive to rapid decomposition of the metal would be present.

A vast amount of literature on soil stabilization has accumulated to which full attention cannot be given. Winterkorn (1946) affords access to a number of references of value to research workers. Most of the information in these reports is concerned directly with soil stabilization for road building. Whatever system is adopted the result must be a type of waterproofed mechanical stabilization. Winterkorn discussed the use of both bitumen and Portland cement. Mainfort (1945) discussed the effect of waterproofing agents including sodium silicate-sodium aluminate, resins formed from furfuryl alcohol treated with sulfuric acid, tung oil, linseed oil, rubber latex and petroleum oil thickened with aluminum stearate. Values for these materials are plotted in terms of moisture content on immersion, load and compressive strength. McAlpin, Mainfort and Winterkorn (1944) discussed both the theory and practice of using a complex salt of abietic acid (resin stabilizer 321) as a soil stabilizer and waterproofing agent.

It is imperative that the bacteriologist working on methods of soil stabilization familiarize himself with various soil types and methods of mixing and compacting stabilizing materials. Since wearing surfaces are not involved, as in the case of road building, much of the available test data are of no value. Instead, water absorption tests and water infiltration or percolation studies should be made upon the stabilized materials.

At present there is probably no satisfactory method to water-proof soil around pipelines. Although, under proper conditions, it may be possible to use a single material, combinations of two or more should be tried. Research workers in this field should pay particular attention to compacting the soil tightly around the pipe to make a perfect seal, for if water penetrates to the line, anaerobic corrosion will proceed more rapidly.

### Recommended Methods

Methods Recommended for Future Investigations:—Laboratory studies must be made of the sulfate-reducing anaerobes so that all of their physiological processes will be understood. It is much easier to control or eradicate a biological pest when all of the factors relating to its metabolism are known. It is necessary to develop laboratory media upon which the organisms will grow quickly in order to discover pertinent facts about the organisms, to identify them and finally to correlate their characteristics with field observations. The concentration of various gases that are essential as well as those that are toxic should be investigated. The possibility of symbiosis of *Sporovibrio desulfuricans* with other bacteria of the soil should be investigated also.

Other investigations of the metabolism of these organisms should take into account the sulfur and phosphorus content of certain cast pipes in order to determine whether these

elements are readily available or entirely unavailable to the groups of organisms under study. These experiments must be conducted under well-controlled laboratory conditions in which the pulverized pipe is used as the source of phosphorus and sulfur.

Experimental equipment should be designed so that accelerated effects of corrosion may be observed on a large-scale. In addition to treating pipe in soil under field conditions a simultaneous study should be made of pipe in pits maintained under anaerobic conditions. These pits should be large enough to contain representative lengths of pipes and joints and may be lined with either inert materials or those on which additional data are desired. After the pipes have been treated with toxic compounds or surrounded with stabilized soil, the pits should be filled with soil limed to pH 6.0-7.0, the optimum for sulfate-reducing bacteria, inoculated with large quantities of crude cultures of *Sporovibrio desulfuricans* and then flooded with a solution containing magnesium sulfate and energy material, such as dextrose. Periodic examination for sulfate and reducing sugars will determine when these materials should be replenished. Measurements of pH, bacterial count, redox potential and other data should be obtained regularly also.

#### Periodic Examination

The pits should be drained and examined once a year, comparable, under the suggested conditions, to years of corrosive action under field conditions. These data cannot be applied directly to field conditions since the results would be modified greatly by the soil types through which pipelines are laid, but maximum corrosive damage could be estimated.

Although this type of research is in the realm of soil and water bacteriology as well as in soil physics and chemistry, it is not practicable for educational institutions to initiate it since the results would be directly applicable to industry. However, these problems might be studied by the cooperative efforts of interested industries and the personnel of educational institutions.

Since completing this paper the author has received a personal communication from Dr. Hans F. Winterkorn in which he states:

"It might be of interest to you that on the basis of our findings on the effect of microbial life in stabilized soils and the use of bactericidal and bacteriostatic agents, I have applied for patent protection of the use of such agents in soil stabilization."

#### BIBLIOGRAPHY

- Beckwith, T. D. (1941) The bacterial corrosion of iron and steel. *J. Am. Water Works Assn.* 33: No. 1. 147-165.
- Bunker, H. J. (1937) The micro-biological aspect of anaerobic corrosion. *11<sup>e</sup> Congr. Mondial Du Petrole*, Paris. R.348-S.3: 1-3.
- (1938) Anaerobic soil corrosion. The function of the sulfate-reducing bacteria. *Iron and Steel Institute, Fifth Report of the Corrosion Committee, Section F, Part 3*: 431-434.
- (1939) Micro-biological experiments in anaerobic corrosion. *Society of Chemical Industry, LVIII*: 93-100.
- (1942) The control of bacterial sulfate reduction by regulation of hydrogen-ion concentration. *Proc. Soc. Agr. Bact. (Abst.)* 1-3.
- (1944) The corrosion of mains in clay soils. *J. Inst. Sanitary Engineers*, No. 5: 211-235.
- Hadley, R. F. (1939) Micro-biological anaerobic corrosion of steel pipelines. *Oil and Gas J.* 33: Sept. 21, 1939.
- (1940a) Methods of studying micro-biological anaerobic corrosion of pipe lines. *The Petroleum Engineer*, 11: Mar., pp. 171, Apr., pp. 112.
- (1940) Studies in micro-biological anaerobic corrosion. *Am. Gas Assn., Technical Section*: 1-23.
- (1943) The influence of *Sporovibrio desulfuricans* on the current and potential behavior of corroding iron. *Susquehanna Pipe Line Co.*, Copyright, 1943.
- Hogg, Charles (1944) See Bunker (1944) pp. 227-228.
- Lessing, R. (1944) See Bunker (1944) p. 229.
- McAlpin, G. W., Mainfort, R. C. and Winterkorn, H. F. (1944) A laboratory study of the soil stabilizing effectiveness of a complex salt of abietic acid. U. S. Department of Commerce, Civil Aeronautics Administration. Technical Development Note No. 35.
- Mainfort, R. C. (1945) A laboratory study of the effectiveness of various chemicals as soil stabilizing agents. U. S. Dept. of Commerce, Civil Aeronautics Administration. Technical Development Note No. 40.
- Knudson, H. A. (1940) Corrosion and Tuberculation. *J. Am. Water Works Assn.* 32: 387-393.
- Pain, Claude (1944) See Bunker (1944) pp. 229.
- Romanoff, Melvin (1943) Effect of aeration on the hydrogen-ion concentration of an anaerobic soil. *Bureau of Standards, Soil Corrosion Conference*.
- (1945) Effect of aeration on hydrogen-ion concentration of soils in relation to identification of corrosive soils. *J. Res. Nat'l Bur. Standards* 34: 227-241.
- Starkey, R. L. (1937) Formation of sulfide by some sulfur bacteria. *J. Bact.* 33: 545-571.
- (1938) A study of spore formation and other morphological characteristics of *Fibrio desulfuricans*. *Arch. Mikrobiol.* 9: 268-304.
- (1945) Transformation of iron by bacteria in water. *J. Am. Water Works Assn.* 37: 963-984.
- and Wight, K. M. (1943) Soil areas corrosive to metallic iron through activity of anaerobic sulfate-reducing bacteria. *Am. Gas Assn. Monthly* 25: 223-228.
- (1945) Anaerobic corrosion of iron in soil. Final Report of the Am. Gas Assn. Iron Corrosion Research Fellowship.
- Thomas, A. H. (1942) Role of bacteria in corrosion. *J. Water Works and Sewerage* 83: 367-372.
- Winterkorn, H. F. (1946) Principles and practice of soil stabilization. *Colloid Chemistry, Theoretical and Applied*, Vol. 6. Reinhold Publishing Corp., New York.

## Gas Crews Praised For Disaster Aid



Martin J. Miller, Auto Maintenance Department, Southern California Gas Co., caught making one of the most unusual rescues

THE emergency organization of the Southern California Gas Co. had its stiffest test in several years on February 20 when a perchloric acid explosion demolished the O'Connor Electro-Plating plant in Los Angeles and spread devastation over a wide area. The speed and efficiency of the "gas gangs" is attested by a letter of commendation written by Chief John H. Alderson of the Los Angeles Fire Department after the disaster and addressed to Executive Vice-President Harry L. Masser.

"Officers who worked at the scene of the explosion on February 20 in the vicinity of Pico Boulevard and Stanford Avenue have commended to me the splendid cooperation that was received from employees of your organization particularly in the rapidity and thoroughness with which all gas was shut off in the area and the checking and rechecking which was done to be sure all precautions had been taken. I wish to thank them and commend them to you for the assistance they furnished to this department."

## Pittsburgh Natural Gas Heating Regulations

REGULATIONS to control the adoption of natural gas heating by new users and thereby protect the present gas supply for commercial, industrial and residential consumers in the Greater Pittsburgh area were effective from March 1 for customers of Equitable Gas Co., The Manufacturers Light and Heat Co. and The Peoples Natural Gas Co.

The regulations, approved by the Pennsylvania Public Utility Commission, have been made part of the tariffs of the three companies and apply to all types of existing and new buildings, including residential, commercial, industrial and public.

Domestic and commercial users of natural gas in that area used six billion cubic feet of natural gas more in 1946 than in 1943, the previous all-time peak.

About 21 percent more gas was used in December 1946 than in December, 1945. Peak load demands on coldest days, the real test of the amount of gas which can be delivered to gas users, nearly doubled on the coldest day so far this winter, as against the coldest day in the winter of 1945-46, the companies report.

## Canadian Appointment

G. S. DAWSON, former sales manager for the B. C. Electric Railway Co., Ltd., Vancouver, British Columbia, was recently appointed superintendent of gas engineering for the company.

Mr. Dawson will advise on all gas construction and distribution activities embracing \$2 million expenditures within the next year and a half.



## Laboratories

ARTHUR F. BRIDGE, Chairman

R. M. CONNER, Director

## A. G. A. Requirements Investigations

TECHNICAL investigations of important projects in the current requirements program of the American Gas Association have been completed at the Cleveland Laboratories and will shortly be reported to the interested committees.

These new studies are expected to influence the trend of future requirements as well as aid materially in facilitating test procedures. They are part of the standardization program financed by the Association.

Included are a newly developed accelerated procedure for low water cut-off devices which will greatly shorten the present time to test these devices, improved test methods to determine durability of two-piece range top burners, serviceability of automatic pilots on hotel and restaurant ranges, and effects of attached duct work on performance of unit heaters.

Studies in progress include improvement of testing technique for measuring efficiency of central heating appliances, charting of performance data of thermostats used in connection with hotel and restaurant ranges and development of improved means for testing gum filters.

## Test Kitchens Aid Ventilation Study

A KITCHEN grease deposition study, supplementing extensive research data compiled and published on various methods of kitchen ventilation in Research Bulletin 40 last year, is under way at the American Gas Association Testing Laboratories under the sponsorship of the Association's Technical Advisory Group for Domestic Gas Cooking Research.

Residential building trends towards smaller homes and correspondingly more compact kitchens have rapidly brought kitchen ventilation to the fore and the present study is designed to advance design techniques.

An accelerated test method is employed, six months' operation of the test kitchens representing the equivalent of a year's actual use in the average home. Three kitchens have been erected in the Research Center of the Laboratories. One is a control unit with

no forced-ventilation. The other two are representative of contemporary designs, one employing the "hood" method and one employing the "Rochester" method of forced-ventilation.

To date 130-cycles of cooking operations have been completed, estimated as the equivalent of preparing 390 meals per kitchen.

## Requirements Group Names Chairman

GEORGE M. NASH, utilization engineer, Central Hudson Gas & Electric Corp., Poughkeepsie, New York, has been appointed chairman of the American Gas Association's Subcommittee on Approval Requirements for Incinerators by C. H. Waring, Chairman of the Approval Requirements Committee. Mr. Nash succeeds Henry Behrman of The Brooklyn Union Gas Co., who resigned due to ill health.

Other members of the committee are W. W. Baughman, The Ohio Fuel Gas Co.; Guy Corfield, Southern California Gas Co.; Leland Bannister, Valley Welding and Boiler Co.; E. O. Howle, Condensation Engineering Corp., and M. A. Naulin, Bowser, Inc.

An early committee meeting is planned to consider the adoption of revised incinerator requirements to cover recent developments.

## Purchase Plan Advanced For Gas Heating

A PROPOSAL that cooperating contractor-dealers consider quoting flat prices, including all costs for buying and installing gas household heating equipment has been advanced by Consolidated Edison Co. of New York, Inc.

During a luncheon at the Hotel Lexington, attended by more than 100 contractor-dealers and manufacturers of gas equipment, E. F. Jeffe, vice-president, said that the use of flat price quotations would be welcomed by everyone from manufacturers to home owners. He distributed survey forms, proposed as a basis for estimating standard equipment and installation requirements and costs.

Mr. Jeffe made it clear that all profit on installations resulting from home surveys completed by the utility's field survey engineers will be reaped by cooperating manufacturers of equipment and contractor-dealers. But the company wants to get firm prices from the trade, which will enable them to quote a complete price on recommended installations, including costs of equipment, installation charges and insulation charges, he said.

Mr. Jeffe said that his company has a sales engineering bureau qualified to lay out requirements for gas heating for industrial, commercial and household users. These facilities, he said, are available to all cooperating dealers, without charge, and plans and estimates developed in the bureau will be given to the trade as projects develop.

## F. P. C. Utility Directory

THE Federal Power Commission has issued a new directory containing data on all of the gas and electric utilities in the United States as of January 1, 1946.

The directory covers 1161 gas systems and contains the following information: name and address of utility, state of incorporation, name of controlling company, names of officials by functions, services rendered, utility plant investment and capacity, number of employees, quantity of electricity or gas distributed, sales by class of customers, B.t.u. content and kind of gas distributed, names of communities served and population of each.

The volume contains 489 pages and is bound in flexible buckram. The price is \$5.00. It may be ordered from the Federal Power Commission, 1800 Pennsylvania Avenue, N. W., Washington 25, D. C. When ordering, please refer to the publication as S-51.

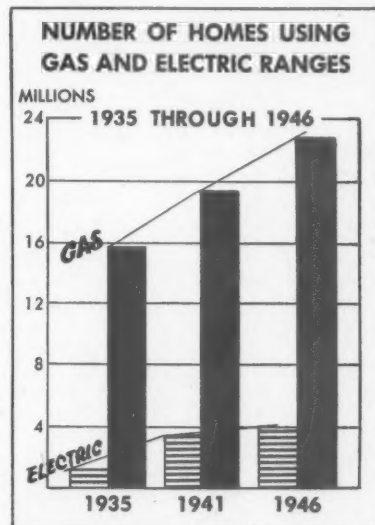
## Gas Industry Gains Cooking Customers

THE gas industry gained 7,100,000 cooking customers from 1935 to 1947 despite war-time restrictions during five of the 11 years of this period, according to the Gas Appliance Manufacturers Association. This is a 45 percent increase over the 15,752,000 homes which cooked with gas in 1935 and brings to 22,900,000 the number of homes in the United States using gas ranges.

During the same 11-year period, 2,800,000 additional families purchased electric ranges and brought the total number of electric cooking customers to 4,000,000.

Better than 90 percent of all homes on piped gas lines use gas for cooking, and 62 percent of all homes in the United States cook with either piped or LP (bottled) gas.

Rural LP gas cooking customers total 3,500,000 and have increased more than 600 percent since 1935. The number of electric range installations in rural territories totals 1,785,000.





# Associated Organization Activities

## Program Announced For Annual G. A. M. A. Meeting



D. P. O'Keefe

**T**HE tentative program for the twelfth annual meeting of the Gas Appliance Manufacturers Association at the Drake Hotel, Chicago, April 14-16, has been announced by the program committee under the chairmanship of F. J. Nugent, Rheem Manufacturing Company.

The opening day will be devoted to meetings by the G.A.M.A. Board of Directors, and various groups and committees. General sessions will be held the mornings of April 15 and 16, followed by division and group meetings both afternoons.

D. P. O'Keefe, G.A.M.A. president, will preside at both general sessions. In addition to Association reports, the first general session will include a talk by R. H. Hargrove, president, American Gas Association, entitled "We Serve." H. Carl Wolf, A. G. A. managing director, will speak on "Aggressive Programs Make a Progressive Industry."

Topics to be covered at the second general session will include the following: the LP Gas Industry—Howard D. White, executive vice-president, Liquefied Petroleum Gas Association; Postwarfare—Lyman L. Hill, Servel, Inc.; Trends in Employee Benefit Plans—I. Austin Kelly, III, director, National Employee Relation Institute, and "The Flame of Freedom"—H. Vinton Potter, director, A. G. A. New Freedom Gas Kitchen Bureau.

Henry J. Taylor, author, economist and war correspondent, will speak at the luncheon on April 15, and Colonel Jack Major, humorist, will highlight the luncheon the following day.

## P. C. G. A. Workshop

**R**ITA CALHOUN, home service director, Portland Gas and Coke Co., is chairman of the P.C.G.A. Home Service Conference and Workshop being held at Timberline Lodge, Oregon, April 1 and 2. Scheduled discussions include current activities of home service departments, water heater pro-

motion, including dishwashing and home laundries, frozen foods, kitchen design, clock control, Fourth Zone cookery, and a number of other important topics.

## P. C. G. A. Home Service Conference and Workshop

**A**BROAD-SCOPE discussion program has been planned for the home service conference and workshop of the Pacific Coast Gas Association at Timberline Lodge, Oregon, April 1 and 2.

Rita Calhoun, home service director, Portland Gas and Coke Co., is chairman of the conference. Discussions will include gas company home service activities; water heater promotion, including dishwashing and home laundries; frozen foods; kitchen design; clock control; Fourth Zone cookery and other pertinent topics.

## Record Attendance Expected at S. G. A. Annual Convention

**A**DVANCE accommodation requests indicate a record attendance for the thirty-sixth annual convention of the Southern Gas Association at the Buena Vista Hotel, Biloxi, Miss., April 16-18.

The Buena Vista Hotel will also be host on April 16 to the Southwest Personnel Conference of the American Gas Association, W. H. Senyard, Louisiana Power & Light Co., New Orleans, presiding. Fred R. Rauch, chairman, A. G. A. Personnel Committee, is expected to discuss pointers on Labor Negotiations.

Julia Hunter, Lone Star Gas Co., Dallas, will preside at the S.G.A. Home service workshop on April 16. Dean A. Strickland, United Gas Corp., Houston, and S.G.A. president, will open the workshop. Subjects to be discussed include: water heating, school merchandise programs, home service viewpoint, public relations, kitchen parties for dealers, Fourth Zone cooking, and group discussions. Jessie McQueen, A. G. A. home service counsellor, will speak on "Here and There with Home Service."

An accident prevention roundtable will be held the same day with R. M. Hutchison, Houston Natural Gas Corp., presiding at the morning session and J. Frank Scott, Southern Natural Gas Co., Birmingham, presiding at the afternoon session. Midday feature will be a joint accident prevention-home service luncheon.

Separate afternoon industrial and commercial sales roundtables will be conducted April 16, presided over by R. M. Scoggins, Arkansas-Louisiana Gas Co., Shreveport, and L. W. Crump, Oklahoma Natural Gas Co., Tulsa, respectively.

Dean Strickland will officiate and address the Thursday morning general session. Other gas association speakers will be R. R. Suttle, managing director S.G.A., and R. H. Hargrove, president, and H. Carl Wolf, managing director, A. G. A.

Three Thursday luncheon meetings are

## I. N. G. A. A. Committee Chairmen

**T**HE following committee chairmen for the Independent Natural Gas Association of America are announced by Joseph Bowes, association president:

Regulatory Practices, A. B. Harper, Arkansas-Oklahoma Gas Co., Fort Smith, Ark.; Research and Engineering, E. C. Joullian, Consolidated Gas Utilities Corp., Oklahoma City; Producers, D. D. Harrington, Hagy, Harrington and Marsh, independent producers, Amarillo, Tex.; Royalty Owners, Homer W. Long, royalty owner, Guymon, Okla.; Reserves and Statistics, William H. Wildes, Republic Natural Gas Co., Dallas; Transportation, D. A. Hulcy, Lone Star Gas Co., Dallas; Membership, C. H. Zachry, Southern Union Gas Co., Dallas.

planned for the combined sales, industrial and commercial section, combined operating and accident prevention section and the accounting section.

Other features of the S.G.A. conference with presiding officers and national gas association speakers are as follows:

Sales Conference Section—Thursday afternoon: Presiding—Fred D. Bradley, Southern Union Gas Co., Dallas. Speakers include Charles W. Person, A. G. A. advertising director, and H. Vinton Potter, director A. G. A. New Freedom Gas Kitchen Promotion Bureau.

Operating Section: Presiding—F. L. Carmichael, Lone Star Gas Co., Fort Worth.

Industrial and Commercial Section: Presiding—D. D. Beach, Atlanta Gas Light Co. Association Representative, John J. Bourke, A. G. A. director, Commercial Gas Cooking Promotion.

Accounting Section: Presiding—F. F. McMullen, United Gas Corp., Houston. General Session Friday morning, presiding S.G.A. Vice-President W. L. Woodward, Zenith Gas System, Alva, Oklahoma followed by general session luncheon.

Sales Conference, Friday afternoon: Presiding—Carl H. Horne, Alabama Gas Co., Birmingham. Association Representative, H. Leigh Whitelaw, managing director, Gas Appliance Manufacturers Association.

Afternoon sessions of the operating, and the industrial and commercial section are planned. E. T. Anderson, Atlanta Gas Light Co., will preside at the final session of the accounting section.

## Tritton Reappointed

**B**RUCE R. TRITTON, vice-president of American Stove Co., Cleveland, has been reappointed chairman of the excise tax committee of the Institute of Cooking and Heating Appliance Manufacturers.



## New England Gas Association Twentieth Annual Business Conference



1947-1948 N.E.G.A. officers: Front row, left to right: James A. Cook, president (Lynn Gas & Electric Co.); L. E. Knowlton, past-president (Providence Gas Co.); Edward G. Twohey, vice-president (Worcester County Electric Co.). Back row: Clark Belden, clerk (executive secretary); Otto Price, treasurer (Boston Consolidated Gas Co.) and A. V. S. Lindsley, second vice-president (The Connecticut Light & Power Co.)

**C**OMPREHENSIVE discussion of national gas industry progress and frank examination of current and future problems featured the twentieth annual business conference of the New England Gas Association at Boston's Hotel Statler, March 20-21. Hundreds of eastern gas men showed their appreciation of the interesting and instructive agenda prepared by the program committee under the chairmanship of A. V. S. Lindsley of Waterbury.

An exhibit illustrating A. G. A. activities was held concurrently with the N.E.G.A. conference, and on Friday, March 21, an A. G. A. Executive Board meeting was held.

Following election of officers and directors, Clark Belden, N.E.G.A. executive secretary, presented highlights of the Association's progress and activities during 1946. L. E. Knowlton, engineer, Providence Gas Co., and retiring N.E.G.A. president, presided and presented a stimulating talk on the Association as a vital force serving the public interest.

Members of national gas associations appearing on the program included John A. Robertshaw, vice-president Gas Appliance Manufacturers Association, and American Gas Association representatives R. H. Hargrove, president, Edwin L. Hall, coordinator, Gas Production Research Committee, and H. Carl Wolf, managing director.

Highlighted on the program were both public relations and public interest in labor and management relations. Speakers included Glenn Griswold, publisher "Public Relations News," N. Y., and Professor E. Wight Bakke, Yale University. N. S. B. Gras, professor

of business history, Harvard Graduate School of Business Administration, examined the future for private industry, and remarked that barring a spiritual revival, only an aggressive advance in the field of public relations can help maintain private enterprise on the old level.

Paul R. Taylor, vice-president, Stone & Webster Service Corp., New York, and former director, Natural Gas Division, Office of War Utilities, War Production Board, Washington, discussed the approach of natural gas to New England, coordination of natural gas with manufactured gas, and general problems involved.

Six gas company executives participated in a liquefied petroleum gas panel which brought out useful information on peak load enrichment and conversion of small gas plants.

Among other speeches presented were "What's Cooking in the Commercial and Industrial Fields?" by Roy E. Wright, director of Gas Sales, Negea Service Corp.; "Management-Made Economics of the Gas Business" by Robert E. Ginna, vice-president, Rochester Gas & Electric Corp., and "Industrial Management Looks Ahead," by Louis Ruthenburg, president, Servel, Inc.

B. A. Seiple, president, Jersey Central Appliance Co., and R. Louis Towne, general sales manager, the McIntyre Co., discussed dealer relations and new sales methods, respectively.

James A. Cook, vice-president and general manager, Lynn Gas & Electric Co., was elected president of the New England Gas Association for 1947-1948. Other new officers named at the conference are: first vice-presi-

dent—Edward G. Twohey, vice-president, Worcester County Electric Co.; second vice-president—A. V. S. Lindsley, vice-president, The Connecticut Light & Power Co., Waterbury; reelected treasurer—Otto Price, vice-president, Boston Consolidated Gas Co.; reelected clerk—Clark Belden, executive secretary, The New England Gas Association, Boston.

Five divisional chairmen were selected: Accounting—C. R. Prichard, Jr., Gas Service, Inc., Nashua; Industrial—E. L. Power, Cambridge Gas Light Co.; Manufacturers—C. H. Ackerman, C. H. Ackerman Co., Newton; Operating—C. W. Rainville, Jr., Salem Gas Light Co., and Sales—John A. Hiller, Portland Gas Light Company.

The Home Service Group elected the following officers: chairman—Margot Whitmire, Springfield Gas Light Co.; vice-chairman—Ella Heyne, Northampton Gas Light Co.; secretary-treasurer—Elizabeth Bullis, Suburban Gas Light Co., Revere, Mass.; executive members—Dorothy O'Meara, Bridgeport Gas Light Co., and May Slaney, Blackstone Valley Gas & Electric Co., Pawtucket, R. I.

Susan A. Mack, home service director, Boston Consolidated Gas Co., presided over the Home Service Group meeting as its retiring chairman. The session opened with a home service breakfast for sales managers, company managers and manufacturers. Brief addresses were given by president-elect James A. Cook, and John A. Hiller, chairman N.E.G.A. sales division. Harold E. Jalass, general sales manager, Cribben and Sexton Co., delivered an informative address on the subject, "Who's Afraid of the Big Bad Wolf."

The 1948 N.E.G.A. annual meeting has already been set for March 18 and 19 by the Association's directors in a move to facilitate reservations.

## Canadian Natural Gas and Petroleum Convention

**T**HE twenty-first annual convention of The Natural Gas and Petroleum Association of Canada will be held at the Royal Connaught Hotel, Hamilton, Ontario, Thursday and Friday, May 22-23.

The annual Golf Tournament will be held at one of the Hamilton golf courses on Thursday afternoon, May 22. This will be followed by a business session in the evening for reports, appointment of committees, and other business.

On Friday, May 23, the morning and afternoon sessions will be devoted to papers, discussion, and a questionnaire on practical problems.

The Convention will close with the annual banquet on Friday evening, May 23.

## Nebraska Expansion

**T**HE Northern Natural Gas Co., Omaha, Nebraska, has requested F.P.C. authority to increase its natural gas pipe line capacity to 580,000,000 cubic feet per day to meet increasing firm gas needs in markets north of its Clifton, Kansas, compressor station. Total cost has been estimated at \$24,500,000.

# Personal and Otherwise

## Lone Star Advertising Director Retires



James M. Floyd



Will C. Grant

**W**ILL C. GRANT has retired as advertising director of Lone Star Gas Co., Dallas, and James M. Floyd has been appointed his successor.

Mr. Grant has been active in American Gas Association publicity and advertising for years and is at present a member of the A. G. A. Publicity & Advertising Committee and both the Domestic and Industrial and Commercial Copy Committees of the gas industry's national advertising program.

Mr. Grant announced his retirement from the company in order to be relieved of administrative duties and to do some trade journal writing. He will be southwestern editorial representative for Robbins Publishing Co., New York. In announcing Mr. Grant's retirement, President D. A. Hulcy said that he had accepted the resignation with regret because Mr. Grant had rendered effective service in a position of responsibility. He organized the advertising department in January, 1929, and since then has been active in civic and advertising affairs in the southwest.

Mr. Floyd has been connected with the gas company since 1937. He was formerly assistant city attorney in Fort Worth, but will move to Dallas in his new position.

## Conlon and Moore Merger

**M**ERGER of the Conlon Corp., Chicago, and the Moore Corp., Joliet, Ill., with the continuing concern to be known as the Conlon-Moore Corp. is announced by Bernard J. Hank, president.

The Conlon Division produces household washers and ironers. The Moore Division

manufactures a wide variety of gas ranges and heaters, coal and oil heaters, combination gas and coal ranges, and other appliances in the cooking and heating lines.

Other officers have been elected as follows: Louis R. Peyla, Joliet, vice-president; I. N. Merritt, vice-president and general manager, Conlon Division, Chicago; Harry T. Worthington, vice-president and general manager, and John M. Foxx, vice-president in charge of sales, Moore Division, Joliet; J. J. Hank, vice-president and general manager, Dickinson-Brighton Foundry Division, Chicago; Herbert H. Kennedy, secretary.

## Bryant Establishes Fuels Scholarship

**T**HE Bryant Heater Co. has established a graduate fellowship for study at Case School of Applied Science, Cleveland, Ohio, according to an announcement by Dr. Elmer Hutchisson, dean of the Graduate Division. It is expected that the fellow's thesis will be concerned with gaseous fuels or some other fundamental problem of interest to the gas industry.

This fellowship is open to graduates with the Bachelor of Science Degree in Mechanical Engineering from accredited colleges or universities who satisfy the requirements for admission to the Graduate Division of the Case School.

The award carries with it a stipend of \$1,850 from which the tuition of \$500 must be paid. The remainder will be paid to the student at the rate of \$150 a month. The Bryant Heater Company has offered to employ the selected candidate at the prevailing salary for the summer months preceding the fall term in which he begins study.

Applicants for the Fellowship in Gaseous Fuels should file applications by April 1. Necessary forms and information regarding prerequisites and courses of study may be obtained from the Dean of the Graduate Division, Case School of Applied Science, Cleveland 6, Ohio.

## Adams Vice-President



R. C. Adams

**A**PPPOINTMENT of Robert C. Adams, as vice-president of Adams Brothers Mfg. Co., Inc., Pittsburgh, has been announced by E. C. Adams, president. The new vice-president is a grandson of the company's founder.

Mr. Adams assumed his duties in February following completion of studies at the Harvard Graduate School of Business Administration. He was graduated from the University of Pittsburgh in 1940.

He was relieved from active duty in the Army last year with the rank of major after more than four years of service, including three years in the Pacific Theater.

## Appointed Home Service Director



Jane Marshall

**J**ANE MARSHALL of Buckhannon, W. Va., has been appointed home service director of the Cumberland & Allegheny Gas Company with headquarters in Cumberland, Md.

Miss Marshall will be responsible for many phases of home service activities under the general direction of Flora G. Dowler, home service supervisor.

Miss Marshall attended W. Va. University and received a B.S. degree in Home Economics from W. Va. Wesleyan College. For two years prior to entering the WAVES in 1943, she was engaged in home economics work for the Monongahela Power Co., in the territory surrounding Wellsburg, W. Va. After leaving Washington, D. C., in 1945, she returned to W. Va. University for graduate study in home economics.

Miss Marshall replaces Alice Ruth Hoon who moved to Baltimore following her recent marriage.

## Ludlow Promoted By Cleveland Heater



Kress V. Ludlow

**K**RESS V. LUDLOW has been appointed general sales manager of The Cleveland Heater Co., according to an announcement by Leo Friedman, president.

Mr. Ludlow joined the company as salesman in 1925 and later became district sales manager for territories served by the Columbia System and The East Ohio Gas Company. Prior to 1925 he spent several years with The East Ohio Gas Co. in Cleveland.

Mr. Ludlow will be assisted by S. C. Schnell, who has been active in the company for the past 16 years.

## Dr. Strong Advanced

**D**R. GEORGE H. SPENCER-STRONG, director of research of the Pemco Corp., Baltimore, since 1942, has been elected a vice-president.

Dr. Strong has perfected many new developments in scientific porcelain enamel procedure and as an authority on the subject has written innumerable articles, books, papers, etc.

## Agee Resigns to Open Own Sales Agency



R. S. Agee

**R.** S. AGEE has announced his resignation as vice-president and director of Roberts & Mander Corp. of Hatboro, Pa., in order to establish his own manufacturers' sales agency and wholesale marketing business.

Temporary headquarters will be located at 237 North Bent Road, Wyncote, Philadelphia. Plans call for concentrated coverage of utility and retail outlets in the adjacent Mid-Atlantic area. His agency representation will be restricted to a closely related line of high quality household appliances. Heavy promotional emphasis will be placed on effective customer service and sales training.

Mr. Agee is widely known in appliance trade circles for his national launching of the "CP" gas range program while serving as sales promotion manager of the Gas Appliance Manufacturers Association in New York City. During the three years with that organization he appeared as featured speaker on many convention programs, and prior to that work was sales promotion manager for the Washington Gas Light Co. in Washington, D. C.

He has been in charge of sales at Roberts & Mander for the past six years, and during part of the war period also handled the company's labor relations. He is past president of the Hatboro Rotary Club, vice-chairman of the Domestic Range Division of G.A.M.A., a member of the A. G. A. Kitchen Planning and Domestic Range Committee, and has also represented Roberts & Mander Corporation at many N.E.M.A. and L.P.G.A. activities.

## Ferris Is Honored By New Jersey Utility

**H.** ERBERT H. FERRIS, who has been associated with the gas utility industry for more than 47 years, was honored at a recent testimonial dinner on the occasion of his retirement as general manager of the gas department, Public Service Electric and Gas Co., Newark, N. J.

Mr. Ferris was presented a gold wrist watch and wristband, on behalf of those present, by Robert H. Philipps, Jr., his successor, who has served in the company's gas department since 1911. He also received a leather-bound book containing the names of his associates. President George H. Blake, who attended the dinner with other company officials, has announced two other appointments in the gas department. Otto Reiner has been named assistant general manager and Henry W. Nicholson, general superintendent of gas distribution.

Starting with the company November 15,

1900, as assistant to the superintendent, Hudson County Gas Co., Mr. Ferris was promoted to superintendent of the Hoboken Gas Works in January, 1903. Two years later he was promoted to superintendent of West End Gas Works, and remained there until November, 1913, when he was promoted to engineer of manufacture, Essex Division. Nine years later, he was made General Superintendent of Manufacture, General Office, and in 1926, was promoted to General Manager.

Mr. Ferris is a member of the American Gas Association, Society of Gas Lighting, and a trustee of Worcester Polytechnic Institute.

## Rochester Appointment



Willis E. Hughes

He received his engineering education at Cornell and joined the Rochester utility as a safety engineer 23 years ago. In addition to heading the Employee Relations Department, Mr. Hughes will be superintendent of the Employees' Benevolent Association and a member of the company Pension Committee.

## Laundry Institute Director



Margaret Doughty

serving as head of the household equipment department in the college of home economics, Washington State College.

Miss Doughty heads the firm's nationwide home service program, supervises practical laboratory testing, edits the company's publication for home service women—*Through the Porthole*, directs training of distributor home service directors, and represents the company as a speaker and advisor on home laundry activities.

Miss Doughty is a member of the American Home Economics Association and the American Dietetics Association.

## Rockwell Elected President



W. F. Rockwell, Jr.

re-elected.

**W.** F. ROCKWELL, JR., has been elected president of the Rockwell Manufacturing Co., Pittsburgh. Mr. Rockwell formerly served as vice-president and general manager.

Colonel Willard F. Rockwell, former president, will retain the office of chairman of the board. All other officers have been

## Range Manufacturer Elects Officers

**W.** ILLIAM M. HILLBORN has been elected president of Cribben & Sexton Co., Chicago, manufacturers of Universal Gas Ranges, succeeding George D. Wilkinson, Sr., who retains the position of Chairman of the Board.

Thomas H. Heneage was elected vice-chairman of the board, and Sidney R. Hill was named controller. George D. Wilkinson, Jr., secretary, was also made a member of the board of directors. Wendell C. Davis was re-elected vice-president and treasurer.

The firm has also appointed W. C. Wilkinson as purchasing agent to succeed Carl E. Lyon, retired.

## Heads Range Sales



John H. Emery

**J.** OHN H. EMERY has been elected vice-president and sales manager of Roberts & Mander Corporation. W. B. Eckenhoff will continue as assistant sales manager.

Mr. Emery was formerly manager of the New York office, but has transferred to the home office at Hatboro, Pa., to direct the company's selling and marketing program. He succeeds R. S. Agee who has resigned to enter the manufacturers' agency business.

direct the company's selling and marketing program. He succeeds R. S. Agee who has resigned to enter the manufacturers' agency business.

## New Honeywell Division

**M.** INNEAPOLIS-HONEYWELL Regulator Co. has formed a new sales division to market its warm air registers and grilles, reports John E. Haines, vice-president. L. J. Krause is directing the activities of the new division.

For the past year, Mr. Krause has supervised field surveys and preparation of literature for the new registers, and will direct sales of the products when production is started.



## Servel Participates in Four Radio Shows

ALREADY participating in four network radio shows, Servel, Inc., is making every effort to be selective in choosing programs with highest listener ratings and those which will be of greatest mutual benefit.

The four shows are: "Hollywood Jackpot," aired coast-to-coast over CBS Monday, Wednesday and Friday; "Bride and Groom," heard over 210 ABC stations; "Heart's Desire," a Mutual sustaining program carried by approximately 304 stations Monday through Friday, and "Queen for a Day" also broadcast by Mutual Monday through Friday.

Refrigerators are given away every three or four weeks on the "Jackpot" show and one refrigerator a week on the other programs.

## All-Time Gas Sendout Record Established

ALL-TIME records for distribution of gas and electricity in the area served by Consolidated Edison Co. of New York, Inc., were set in 1946, according to an announcement by Ralph H. Tapscott, president.

Gas sendout in 1946 was 48,995,000,000 cubic feet, the highest in the history of the company. It surpassed the previous record of

1926 by 8,236,000,000 cubic feet, or 4.8 percent, and was 6.4 percent higher than that of 1945 and 19.1 percent higher than that of 1939. Of the increase recorded since 1939, Mr. Tapscott said, sales to residential and commercial customers accounted for 28 percent, to wholesale accounts 31 percent, for heating 39 percent and to public authorities 2 percent.

On February 5, 1947, Mr. Tapscott said, the company achieved the highest gas sendout in its history. On that day a total of 242,649,000 cubic feet went to customers in Manhattan, the Bronx, parts of Queens and Westchester County.

Outstanding feature in the growth of the gas sendout, Mr. Tapscott stated, was the increase in demand for automatic house heating by gas. The number of customers employing this form of heating, he said, has increased 104 percent since 1939.

## Bryant Names Miller

PAUL G. MILLER has been appointed representative for the Bryant Heater Company's line of gas-fired heating equipment in central Ohio.

Mr. Miller has established the Bryant-Miller Company at the Gas Building, Springfield, Ohio. He was formerly district manager of The Ohio Fuel Gas Company's Springfield Division, and had previously managed Columbia Gas and Electric properties in Indiana.

was engaged as a consulting engineer by many companies in the United States and Canada prior to starting his work with the War Production Board in 1942.

In addition to serving as president of the American Gas Association, Mr. Barnum was a past-president of the American Standards Association, the Guild of Gas Managers of New England, and the New England Association of Gas Engineers. He was a member of Beta Theta Phi and Theta Nu Epsilon.

He is survived by his widow, Caroline M., and by a son, Dwight.

**ROBERT H. CLARK**, general superintendent of transportation, Consolidated Edison Company of New York, Inc., died of a heart attack Sunday night, March 23, at his home in Wilton, Connecticut.

Mr. Clark was program chairman of the Motor Vehicle Committee, American Gas Association Technical Section and was to have spoken at the A. G. A. Distribution and Motor Vehicle Conference in Cleveland, April 14-16.

A graduate of Amherst College, Mr. Clark made a study of the automobile industry for the Consolidated Gas Company and worked briefly for five automotive companies until 1924 when he joined the Consolidated Edison System Companies as assistant engineer of transportation of the gas company. He became general superintendent in 1940.

Mr. Clark leaves his wife, Mrs. Ethel Robertson Clark, and a son, Robert H. Clark, 3d.



### HOLDING COMPANIES\*

Pacific Lighting Corp., Los Angeles, Calif. (LeRoy M. Edwards, vice-president & general manager)  
Pacific Public Service Co., San Francisco, Calif. (Ernest G. Lawson, president)

### MANUFACTURER COMPANIES\*

American District Steam Co., North Tonawanda, N. Y. (Herbert P. Culp, research director)  
Chicago Automatic Heater Co., North Chicago, Ill. (W. P. Carothers, secretary-treasurer)  
Davis Machinery Co., Chicago, Ill. (A. W. Rischmiller, owner)  
International Oil Burner Co., St. Louis, Mo. (J. L. Heiman, chief, Research Dept.)  
Leslie Manufacturing Co., Dallas, Texas (E. M. Peacock, superintendent & general manager)  
Lynch Brothers, Inc., Pine Meadow, Conn. (Walter T. Lynch, president)  
M & K Welding Works, Culver City, Calif. (Joseph H. Klivans, partner)  
McCulloch Motors Corp., Los Angeles, Calif. (R. P. McCulloch, president)  
Robinson Heaters, Inc., Columbus, Ohio (Harry J. Robinson, president)  
Thermek Engineering Corp., San Francisco, Calif. (A. F. Tudury, vice-president & chief engineer)

### INDIVIDUAL MEMBERS

A. A. Anderson, Pennsylvania Power & Light Co., Sunbury, Pa.  
E. J. Beck, Pacific Gas & Electric Co., Woodland, Calif.  
Alec R. Bennett, Radiation Ltd., Birmingham, England  
John L. Bird, Pacific Gas & Electric Co., Sacramento, Calif.  
V. E. Brooks, Mountain Fuel Supply Co., Salt Lake City, Utah  
John R. Buckley, Pacific Gas & Electric Co., San Francisco, Calif.  
Arthur W. Carlson, A. O. Smith Corp., Kankakee, Ill.  
Paul W. Carrington, Pacific Gas & Electric Co., Sacramento, Calif.  
Herbert S. Cooke, Richmond Radiator Co., Uniontown, Pa.  
John B. Cookenboo, Houston Natural Gas Corp., Houston, Texas

\* Names in parentheses are Company Delegates of the American Gas Association.

## Obituary



Dana D. Barnum

**DANA D. BARNUM**, president of the American Gas Association 1921-1922, and for 20 years president of the Boston Consolidated Gas Co., died suddenly, March 19, at his home in Washington, D. C. At the time of his death he was a member of the Contract Settlement Board of the War Department.

During the war years Mr. Barnum was actively engaged with the War Production Board in Washington, serving first with its Conservation Division and later, from 1942 to 1944, with the Office of War Utilities.

Born in Bethel, Conn., August 15, 1872, Mr. Barnum was graduated from Stevens Institute, New Jersey, as a mechanical engineer and rose from chemical, distribution and engineering work in the Worcester Gas Light Co. to the position of chief engineer and finally president. He came to the Boston Consolidated Gas Co. as its president on November 1, 1917.

In 1937 he retired from the presidency and



Douglas L. Cormack, Pacific Gas & Electric, Oakland, Calif.  
 S. E. Cowan, Mountain Fuel Supply Co., Salt Lake City, Utah  
 E. F. Davis, Institute of Gas Technology, Chicago, Ill.  
 Robert V. Dunkle, University of California, Berkeley, Calif.  
 J. H. N. Ellis, Pacific Lighting Corp., Santa Barbara, Calif.  
 Joseph First, Institute of Gas Technology, Chicago, Ill.  
 John Foster, Institute of Gas Technology, Chicago, Ill.  
 H. J. Fox, Institute of Gas Technology, Chicago, Ill.  
 William D. Gay, Kansas City, Mo.  
 C. H. Gobrecht, Mountain Fuel Supply Co., Salt Lake City, Utah  
 H. L. Godbier, Pacific Gas & Electric Co., Oakland, Calif.  
 J. L. Hammond, South Carolina Power Co., Charleston, S. C.  
 Ward D. Hopkins, Pacific Gas & Electric Co., Sacramento, Calif.  
 Robert Husch, Institute of Gas Technology, Chicago, Ill.  
 Albert S. Jourdan, The Connecticut Light & Power Co., Meriden, Conn.  
 L. J. Kane, Institute of Gas Technology, Chicago, Ill.  
 Cedric L. Kasten, Pacific Gas & Electric Co., San Francisco, Calif.  
 Sidney Katz, Institute of Gas Technology, Chicago, Ill.  
 Ernest W. Kimmell, Institute of Gas Heating Industries, Santa Monica, Calif.  
 F. H. King, City of Holyoke Gas & Electric Dept., Holyoke, Mass.  
 Herbert W. Korn, New Haven Gas Light Co., New Haven, Conn.  
 Guy A. Librizzi, Bronx, N. Y.  
 John E. Lynch, The Connecticut Light & Power Co., Winsted, Conn.  
 Wade W. MacConnell, Brooklyn Borough Gas Co., Coney Island, N. Y.

John A. McCarthy, Norwich Gas & Electrical Dept., Norwich, Conn.  
 Lloyd McEwen, Institute of Gas Technology, Chicago, Ill.  
 R. W. McGee, Pacific Gas & Electric Co., Oakland, Calif.  
 D. W. Merkeley, Servel, Inc., San Francisco, Calif.  
 F. H. Mitchell, Southern California Gas Co., Los Angeles, Calif.  
 Shiro Mori, Institute of Gas Technology, Chicago, Ill.  
 L. C. Olpin, Mountain Fuel Supply Co., Salt Lake City, Utah  
 Sloan Paxton, Southern Union Gas Co., Pecos, Texas  
 L. A. Peletier, N.V. de Bataafsche Petroleum Maatschappij, Delft, Holland  
 Mary Quaw, The East Ohio Gas Co., Youngstown, Ohio  
 W. A. Reynolds, Jr., Southern California Gas Co., Los Angeles, Calif.  
 Henry W. Rice, The New Britain Gas Light Co., New Britain, Conn.  
 C. H. Riesz, Institute of Gas Technology, Chicago, Ill.  
 Maxine Roberts, Pacific Gas & Electric Co., Sacramento, Calif.  
 J. P. Smith, Pacific Gas & Electric Co., Salinas, Calif.  
 James M. Stafford, United Light & Railways Service Co., Kansas City, Mo.  
 Erwin Strong, Institute of Gas Technology, Chicago, Ill.  
 Chas. D. Sublette, Pacific Gas & Electric Co., Davis, Calif.  
 G. R. Van Kampen, Red-Rad Manufacturing Co., Inc., New York, N. Y.  
 C. G. von Fredersdorff, Institute of Gas Technology, Chicago, Ill.  
 A. W. Way, Pacific Gas & Electric Co., Sacramento, Calif.  
 Frank E. Wilson, Pacific Gas & Electric Co., Sacramento, Calif.  
 Loren A. Woolf, Pacific Gas & Electric Co., Sacramento, Calif.

## JOINT REPORTING

BY A. G. A.-A. P. I.

(Continued from page 177)

only over a period of many years and at gradually declining annual rates. This has been widely demonstrated by past performance under all kinds of operating conditions. Therefore, only incorrect conclusions as to the life of these estimated reserves can be obtained by dividing these reserves by the current rate of production.

For comparative purposes a summary tabulation (Table C) of the overall figures contained in the committee's annual reports covers the period from 1937 to 1946, inclusive. Figures for 1935 and 1936, which were the first developed by the committee, are not available separately.

As in the past, this committee wishes to emphasize the fact that every effort has again been made to secure a fair, unprejudiced, and representative opinion. Each member in his district appointed a number of subcommittees to gather and study the necessary data. All previously determined factors pertaining to the various pools were examined and adjusted in the light of new information. The subcommittees, which were largely responsible for the data, were comprised of geologists and petroleum engineers with long experience in this class of work. We wish to acknowledge the valuable assistance of all those who have cooperated in this undertaking.

TABLE C  
 SUMMARY OF COMMITTEE'S ANNUAL REPORTS COVERING PERIOD 1937-1946  
 (Barrels of 42 U. S. Gallons)

New Oil Blocked Out During Year						
Year	Through Revisions of Previous Estimates and Extensions to Known Fields	Through New Pools Discovered During Year	Total Through New Discoveries, Extensions and Revisions	Production During Year	Estimated Proved Reserves as of End of Year	Increase Over Previous Year
1936					13,063,400,000	
1937	2,792,790,000	928,742,000	3,721,532,000	1,277,664,000	15,507,268,000	2,443,868,000
1938	2,243,571,000	810,493,000	3,054,064,000	1,213,186,000	17,348,146,000	1,840,878,000
1939	2,058,455,000	340,667,000	2,399,122,000	1,264,256,000	18,483,012,000	1,134,866,000
1940	1,607,012,000	286,338,000	1,893,350,000	1,351,847,000	19,024,515,000	541,503,000
1941	1,538,989,000	429,974,000	1,968,963,000	1,404,182,000	19,589,296,000	564,781,000
1942	1,618,925,000	260,051,000	1,878,976,000	1,385,479,000	20,082,793,000	493,497,000
1943	1,202,368,000	282,418,000	1,484,786,000	1,503,427,000	20,064,152,000	(-)18,641,000
1944	1,556,192,000	511,308,000	2,067,500,000	1,678,421,000	20,453,231,000	389,079,000
1945	1,690,315,000	419,984,000	2,110,299,000	1,736,717,000	20,826,813,000	373,582,000
December 31, 1945 Estimated Proved Reserves of Crude Oil only			(see note below and text)		19,941,846,000	
1946	2,413,628,000	244,434,000	2,658,062,000	1,726,348,000	20,873,560,000	931,714,000

Note: Up to and including its figures on Proved Reserves of Petroleum as of December 31, 1945, the Committee combined under that heading the estimated proved reserves of cycle plant and lease condensate. As of December 31, 1945 the reserves so included totaled 884,967,000 barrels and as of December 31, 1944, 668,701,000 barrels. Beginning with this report the figures in this table are for crude oil only. In comparison between new oil reported in 1946 with new oil reported in earlier years, it should be remembered that the 1946 figures for new oil do not include new condensate, estimated at approximately 205 million barrels.

## CLEARER FOCUS ON RESEARCH

(Continued from page 169)

the fruits of research may be translated into production. . . .

"I further believe that training of manpower for the industry without attendant research is like inbreeding—it sharpens the line of current practice, crystallizes prevailing empiricisms, and bars the door to industrial progress."

Derby finds that "Although not all American industrial firms themselves operate research departments, none of them can successfully ignore the tremendous influence of research on the conduct of their business. We who are management employees of businesses realize that research today involves much broader considerations than, let us say, simply the physical improvement of an existing product. It provides a guide for us in decisions bearing on the health and very life of our companies."

In the gas industry not only have we laid the necessary foundations for future growth and economic gains through intelligent application of research, but through technical committees we are putting to work this "main reconnaissance staff of industry" in ways that count most. The confidence in research and the scientific approach expressed by such men as Midgley, Steele, Kettering, Derby, Patterson, Land and DuPont brings us a practical basis for faith in our own endeavors.

## COAL TO GAS

(Continued from page 167)

was limited by the ability to remove heat.

In the fluid type reactor created by Standard Oil scientists, the cooling tubes are immersed in the boiling bed of fluidized solid—an iron catalyst. The rate at which heat is removed is so much higher than in the German type that only one twenty-fifth as much cooling surface is required. This means a large reduction in investment, maintenance, and operating cost. The synthesis product leaving the reactor is cooled in a condenser and passed to a separator where the liquids are separated from the gases.

In addition to the gas and synthetic gasoline produced from coal, there are comparatively large amounts of chemicals such as ethyl alcohol, ketones, and organic acids of commercial value. Com-

pany scientists believe that the chemicals obtained in this way will have an important place in the nation's organic chemical industry.

## BROADER COVERAGE FOR "GAS ABSTRACTS"

(Continued from page 179)

Journal of Research National Bureau of Standards  
Journal of the Society of Chemical Industry  
LP-Gas  
Materials and Methods  
Mechanical Engineering  
Mining Technology  
National Gas Bulletin of Australia  
National Petroleum News  
Natural Gases  
Official Gazette of the U.S. Patent Office  
Oil and Gas Journal  
Oil Weekly  
Petroleum  
Petroleum Engineer  
Petroleum Processing  
Petroleum Refiner  
Petroleum Technology  
Power  
Power Plant Engineering  
Public Utilities Fortnightly  
Refrigerating Engineering  
Steel



## SERVICES OFFERED

**Manager Manufactured or Natural Gas Utility.** Experience covers 20 years operations, consulting, inventory-valuation and new business, also L. P. Gas. Ca anywhere East; interviews arranged. (40). 1541.

**Utility lawyer,** member New York, Maryland bars, 27 years' experience in gas, electric and transportation fields in private practice and with Federal and State governments, desires position counsel public utility or holding company. Salary \$10,000. 1542.

Sixteen years' experience in the industry—production, distribution, utilization, purchasing, sales, rates, special studies, employee training, and customer relations are available to progressive property or manufacturer in a position of responsibility. College graduate, married, go anywhere. Best of reasons for leaving present successful and secure position. (40) 1543.

**Gas Heating Engineer** and experienced man in all types gas appliances since 1910. Would like connection with manufacturer who has production ready for the trade. 1544.

## POSITIONS OPEN

**Assistant to General Manager** of New England Gas Utility—\$50,000 M annually. Prospect of succeeding to General Managership in three or four years. Graduate engineer with background of experience in operating water gas property preferred. Excellent salary prospects. Give full particulars in application. Confidential. 0482.

**Foreman** for medium size New England Plant—water gas using heavy oil. Excellent opportunity for man capable of managing all activities. Give full particulars. 0483.

**General Gas Superintendent** for Latin American gas public utility. Applicant to have experience in manufacture of gas, using Jones oil-gas process or equivalent. Position also requires experience in distribution and customer relations. Salary open. Submit full details of education, experience and references. 0485.

Transactions of the American Institute of Chemical Engineers  
Transactions of the American Institute of Mining and Metallurgical Engineers  
Transactions American Society of Mechanical Engineers  
Transactions of the Faraday Society  
U.S. Bureau of Mines Bulletins,  
Information Circulars, Reports of Investigations and Technical Papers

## "PIG" IN PIPELINE

(Continued from page 173)

is disposed of the "Pig" is reinserted, the line welded together, and the cleaning continued.

The East Ohio Gas Co. has clocked a "Pig" traveling at almost 60 miles an hour. The cleaning purges have pushed out dirt, stones, twigs, lumber, squirrels, rabbits and even overalls. During one East Ohio run the "Pig" claimed nine full-length four-by-four skids, three short skids, a baseball glove and a steel carriage stop.

The steel "Pig" is just one more example of the unending research in modern pipeline construction and maintenance.

**Assistant Superintendent Water Gas Plant** making Synthesis Gas in thirteen 11 foot U. G. I. units. Experienced man with a technical educational background desired, salary commensurate with ability and experience, large Chemical Plant northern West Virginia. 0486.

**Gas Plant Engineer** for plant in New England, having several years experience in coal and water gas manufacture. Supervisory position. Write fully, giving experience, salary expected and date available. Send photo. 0487.

**Product Review Engineer.** Graduate, young, to assist in product review and development work; field or production experience in gas heating or gas appliance designing, redesigning and testing desirable. This is not a routine research assignment. New ideas, imagination and inventiveness helpful. Those meeting these requirements please reply giving brief prospectus of experience. Confidential. Cleveland, Ohio. Salary \$250 to \$300. 0488.

**Gas Engineer,** age about 30, to act as Assistant General Manager for manufacturer of pressure control and national service organization. Starting salary \$400. per month. 0489.

**Research Gas Engineer** familiar with both theory and operation of all gas manufacturing processes and especially complete gasification of coal. Location in Middle Atlantic region. Good opportunity for man, preferably under 40, with good chemical or mechanical engineering education and ability to initiate and carry on new developments. Give full details of education, salary expected etc. 0490.

**Engineer, cadet or apprentice** required by one of the oldest makers of gas fired industrial, commercial and domestic heating equipment. Opening for a young man with a degree in mechanical, electrical, chemical or related engineering, with aptitude for development, experimental, design and test work which will require a good head and a good pair of hands, recently out of college (or the service) with little or no working experience. He should expect to live in a small town and like it, at a beginning salary that he won't brag much about but with the opportunity to get more as soon as he is worth it. 0491.

**Experienced Shift Foreman** for growing 8 million daily Eastern CWG system; reports to Assistant Superintendent and will supervise overall operation of water gas plant. Give full details of experience, age, salary desired. 0492.

**Heating Engineer** for work in the development laboratory of large middle western manufacturer of central heating equipment; young man, sales personality, field experience desirable. Write, stating salary requirements. 0493.

**Graduate Engineer** with field experience on gas fired heating and water heating equipment, to take charge of field service training for firm with national distribution. Must have good personality and the ability to conduct service schools. Will be required to travel as territorial work demands. 0494.

## ADVISORY COUNCIL

ERNEST R. ACKER.....Poughkeepsie, N. Y.  
FRANK H. ADAMS.....Toledo, Ohio  
BURT R. BAY.....Omaha, Neb.  
A. F. BRIDGE.....Los Angeles, Calif.  
FLOYD C. BROWN.....Chicago, Ill.  
LYMAN L. DYER.....Dallas, Texas  
LESTER J. ECK.....Minneapolis, Minn.  
E. F. EMBREE.....New Haven, Conn.  
HENRY FINK.....Detroit, Mich.  
RALPH L. FLETCHER.....Providence, R. I.  
HAROLD L. GADRY.....New Orleans, La.  
GEORGE S. HAWLEY.....Bridgeport, Conn.  
FRANK E. HOENIGMANN.....Gardner, Mass.  
W. ALTON JONES.....New York, N. Y.  
L. E. KNOWLTON.....Providence, R. I.  
MALCOLM LEACH.....Taunton, Mass.  
J. L. LLEWELLYN.....Brooklyn, N. Y.  
H. N. MALLON.....Bradford, Pa.  
L. A. MAYO.....Hartford, Conn.  
NORTON MCKEAN.....New York, N. Y.

C. E. PACKMAN.....Chicago, Ill.  
J. J. QUINN.....Boston, Mass.  
BRUNO RAHN.....Milwaukee, Wis.  
O. H. RITENOUR.....Washington, D. C.  
JOHN A. ROBERTSHAW.....Youngwood, Pa.  
J. FRENCH ROBINSON.....Cleveland, Ohio  
W. F. ROCKWELL.....Pittsburgh, Pa.  
LOUIS RUTHENBURG.....Evansville, Ind.  
B. A. SEIPLE.....Asbury Park, N. J.  
C. V. SORENSON.....Fort Wayne, Ind.  
MARCY L. SPERRY.....Washington, D. C.  
T. J. STRICKLER.....Kansas City, Mo.  
HARRY A. SUTTON.....Newark, N. J.  
CHARLES A. TATTERSALL.....Syracuse, N. Y.  
J. H. WARDEN.....New York, N. Y.  
R. E. WERTZ.....Amarillo, Texas  
HARRY K. WRENCH.....Minneapolis, Minn.  
CHARLES G. YOUNG.....Springfield, Mass.  
P. S. YOUNG.....Newark, N. J.

## ASSOCIATED ORGANIZATIONS

### Gas Appliance Manufacturers Association

Pres.—D. P. O'Keefe, O'Keefe & Merritt Co., Los Angeles, Calif.  
Man. Dir.—H. Leigh Whitelaw, 60 East 42nd St., New York, N. Y.

### Canadian Gas Association

Pres.—Lt. Col. Thomas Weir, Union Gas Co. of Canada Ltd., Chatham, Ont.  
Exec. Sec.—George W. Allen, 7 Astley Ave., Toronto.

### Gas Meters Association of Florida-Georgia

Pres.—B. G. Duncan, South Atlantic Gas Co., Orlando, Fla.  
Sec.-Tr.—J. W. Owen, Central Florida Gas Corp., Winter Haven, Fla.

### Illinois Public Utilities Association

Pres.—C. W. Organ, Central Illinois Light Co., Springfield, Ill.  
Sec.-Tr.—T. A. Schlink, Central Illinois Light Co., Springfield, Ill.

### Indiana Gas Association

Pres.—E. D. Anderson, Northern Indiana Public Service Co., Hammond, Ind.  
Sec.-Tr.—Clarence W. Goris, Northern Indiana Public Service Co., 500 Broadway, Gary, Ind.

### Michigan Gas Association

Pres.—Henry Fink, Michigan Consolidated Gas Co., Detroit, Mich.  
Sec.-Tr.—A. G. Schroeder, Michigan Consolidated Gas Co., Grand Rapids, Mich.

### Maryland Utilities Association

Pres.—O. H. Ritenour, Washington Gas Light Co., Washington, D. C.  
Sec.—Raymond C. Brehaut, Washington Gas Light Co., Washington, D. C.

### Mid-Southeastern Gas Association

Pres.—C. B. Zeigler, Public Service Co. of N. C., Inc., Gastonia, N. C.  
Sec.-Tr.—Edward W. Ruggles, North Carolina State College, Raleigh, N. C.

### Mid-West Gas Association

Pres.—E. C. Deane, Central Electric & Gas Co., Sioux Falls, S. D.  
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

### Missouri Association of Public Utilities

Pres.—J. F. Porter, Jr., Kansas City Power & Light Co., Kansas City, Mo.  
Gen. Counsel—Wm. H. Allen, 101 W. High Street, Jefferson City, Mo.  
Sec.—E. A. Beer, 101 W. High Street, Jefferson City, Mo.

### Natural Gas and Petroleum Association of Canada

Pres.—S. A. Morse, Union Gas Co. of Canada, Ltd., Chatham, Ont.  
Sec.—Jos. McKee, United Gas and Fuel Co. of Hamilton, Ltd., Hamilton, Ont.

### New England Gas Association

Pres.—James A. Cook, Lynn Gas & Electric Co., Lynn, Mass.  
Exec.-Sec.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

### New Jersey Gas Association

Pres.—P. D. Gardner, Public Service Electric and Gas Co., Camden, N. J.  
Sec.-Tr.—Elmer A. Smith, Public Service Electric and Gas Co., Newark, N. J.

### Oklahoma Utilities Association

Pres.—S. I. McElhoes, Public Service Company of Oklahoma, Chickasha, Oklahoma.  
Sec.—Kate A. Niblack, 625 Biltmore Hotel, Oklahoma City, Okla.

### Pacific Coast Gas Association

Pres.—Le Roy M. Edwards, Pacific Lighting Corp., Los Angeles, Calif.  
Man. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

### Pennsylvania Gas Association

Pres.—Frank H. Trembly, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.  
Sec.—William Naile, Lebanon Valley Gas Co., Lebanon, Pa.

### Pennsylvania Natural Gas Men's Association

Pres.—E. M. Borger, The Peoples Natural Gas Co., Pittsburgh, Pa.  
Exec. Sec.—Mark Shields, 2619 Grant Bldg., Pittsburgh, Pa.

### Southern Gas Association

Pres.—Dean A. Strickland, United Gas Corp., Houston, Texas.  
Man. Dir.—Robert R. Suttle, 1230 Mercantile Bank Building, Dallas 1, Texas.

### Wisconsin Utilities Association

Pres.—B. E. Miller, Wisconsin Power and Light Co., Madison, Wis.  
Exec.-Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

# AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

A. G. A. TESTING LABORATORIES • 1032 East 62nd Street, Cleveland 14, Ohio • 1425 Grande Vista Avenue, Los Angeles, Calif.

## ◀ OFFICERS ▶

President .....	R. H. HARGROVE.....	Shreveport, La.
First Vice-President .....	HUDSON W. REED.....	Philadelphia, Pa.
Second Vice-President .....	ROBERT W. HENDEE.....	Colorado Springs, Colo.
Treasurer .....	EDWARD F. BARRETT.....	Mineola, N. Y.
Assistant Treasurer .....	V. T. MILES.....	Mineola, N. Y.
Managing Director .....	H. CARL WOLF.....	New York, N. Y.
Secretary .....	KURWIN R. BOYES.....	New York, N. Y.

## ◀ DEPARTMENT CHAIRMEN ▶

Manufactured Gas Department .....	HUDSON W. REED.....	Philadelphia, Pa.
Natural Gas Department .....	ROBERT W. HENDEE.....	Colorado Springs, Colo.

## ◀ SECTION VICE-PRESIDENTS AND CHAIRMEN ▶

Accounting Section .....	L. V. WATKINS.....	New York, N. Y.
Residential Gas Section .....	WALLACE M. CHAMBERLAIN.....	Grand Rapids, Mich.
Industrial & Commercial Gas Section.....	KARL EMMERLING.....	Cleveland, Ohio
Manufacturers' Section .....	R. L. O'BRIEN.....	Detroit, Mich.
Publicity & Advertising Committee .....	E. M. THARP.....	Columbus, Ohio
Technical Section .....	C. S. GOLDSMITH.....	Brooklyn, N. Y.

## ◀ DIRECTORS ▶

F. M. BANKS.....	Los Angeles, Calif.	D. P. HARTSON.....	Pittsburgh, Pa.
R. G. BARNETT.....	Portland, Ore.	LYLE C. HARVEY.....	Cleveland, Ohio
WALTER C. BECKJORD.....	Cincinnati, Ohio	D. A. HULCY.....	Dallas, Texas
A. M. BEEBEE.....	Rochester, N. Y.	GEORGE F. MITCHELL.....	Chicago, Ill.
EVERETT J. BOOTHBY.....	Washington, D. C.	HENRY H. MORSE.....	Gardner, Mass.
JAMES A. BROWN.....	New York, N. Y.	E. P. NOPPEL.....	New York, N. Y.
HENRY R. COOK, JR.....	Baltimore, Md.	D. P. O'KEEFE.....	Los Angeles, Calif.
E. H. EACKER.....	Boston, Mass.	C. E. PAIGE.....	Brooklyn, N. Y.
R. E. FISHER.....	San Francisco, Calif.	JOHN C. PARKER.....	New York, N. Y.
J. N. GREENE.....	Birmingham, Ala.	FRANK C. SMITH.....	Houston, Texas
H. E. HANDLEY.....	Jackson, Mich.	A. H. STACK.....	Tampa, Fla.
		E. J. TUCKER.....	Toronto, Ont.

## ◀ ASSOCIATION STAFF ▶

Managing Director.....	H. CARL WOLF	Home Service Counsellor.....	JESSIE McQUEEN
Assistant Managing Director.....	JOHN W. WEST, JR.	Director of Promotion.....	JOHN H. WHITE, JR.
Assistant Managing Director and Director, Natural Gas Dept....	GEORGE H. SMITH	Director, New Freedom Gas Kitchen Program.....	H. VINTON POTTER
Secretary and Convention Manager.....	KURWIN R. BOYES	Director, Advertising.....	CHARLES W. PERSON
Secretary, Manufactured Gas Dept. and Technical Section.....	A. GORDON KING	Director, Publicity.....	GEORGE A. McDONALD
Controller.....	O. W. BREWER	Director, Testing Laboratories (Cleveland, Ohio) .....	R. M. CONNER
Secretary, Accounting Section and Director, Bureau of Statistics.....	WALTER E. CAINE	Supervisor, Pacific Coast Branch Laboratories (Los Angeles, Calif.).....	W. H. VOGAN
Secretary, Industrial and Commercial Gas Section....	MAHLON A. COMBS	Coordinator of General Research.....	EUGENE D. MILENER
Secretary, Residential Gas Section.....	F. W. WILLIAMS	Coordinator, Gas Production Research.....	EDWIN L. HALL
		Utilization Engineer.....	C. GEORGE SEGELER

Editor, A. G. A. MONTHLY.....JAMES M. BEALL



